ACTUALITÉS SCIENTIFIQUES ET INDUSTRIELLES

449

EXPOSÉS DE PHILOSOPHIE SCIENTIFIQUE

CHARLES W. MORRIS
Associate Professor of Philosophy, University of Chicago

I

LOGICAL POSITIVISM PRAGMATISM AND SCIENTIFIC EMPIRICISM

BY

CHARLES W. MORRIS
University of Chicago

PARIS
HERMANN ET Cie, ÉDITEURS
6, Rue de la Sorbonne, 6

1937

PREFACE

SCIENTISTS and philosophers are beginning to work together in earnest on common tasks and with a common temper. The advance of science has brought into open light the hidden metaphysical and conventional elements which had insinuated themselves into the Newtonian tradition; the continuation of philosophical speculation has only increased the dissatisfaction which the critical mind feels in the presence of the historical philosophical systems. A new type of mind is demanded and is appearing, especially in the younger thinkers : that of the logician-scientist who is content neither with the verbiage of most philosophical speculation nor with the mere repetition of non-analysed and non-systematized scientific concepts and propositions. The old ideal of a unified science appears in a modern form in which it is realized that the goal of philosophy and of science is ultimately the same. Scientific philosophy is not ultimately different from philosophical science, — the two phrases refer more to the connections with one or another of two historic backgrounds rather than to divergent goals. Through the rapidly developing interest in the history and in the logic of science, science is coming to be aware of itself as a whole, while philosophers in whom the logical temper is dominant over the metaphysical are attempting to link their work with science in a common enterprise. The purpose of this little volume — and of the series — is to help define and to further this common task. The component papers are reprinted by permission.

The approach is made from the point of view of *scientific empiricism*. By this term is meant the temper which accepts propositions into the system of knowledge in proportion as they

are verified by observation of the things or kind of things meant, but which does not want to exclude from consideration whatever rationalistic, cosmological, or pragmatic factors prove to be integral parts of the scientific method or edifice. The *organon* of this temper is regarded as lying in the general theory of signs (semiotic). Analysis reveals that linguistic signs sustain three types of relations (to other signs of the language, to objects that are signified, to persons by whom they are used and understood) which define three dimensions of meaning. These dimensions in turn are objects of investigation by syntactics, semantics, and pragmatics, semiotic being the general science which includes all of these and their interrelations[1]. It turns out that formalism, empiricism, and pragmatism are simply emphases upon one or another of the three dimensions of meaning, that while neither is the whole story each is an important part, and that the three are complementary in the same way that theory, observation, and experimentation are integrated in scientific method. Scientific empiricism thus proves capable of uniting the insights of logical positivism, of the traditional empiricism, and of critical pragmatism.

Historically the traditional empiricism aligned itself most radically with the new formal logic in the logical positivists, and with the new biological and social sciences in Comtism and pragmatism. Each side has then made independent steps toward a still wider synthesis : thus the view as to the analytic nature of mathematics has been combined by Hahn and Carnap with an instrumental or pragmatic interpretation of the function of mathematics, while the theory of truth held by these men (as well as by Reichenbach and Frank) has become very similar to the position of Dewey and Lewis. On the other hand certain pragmatists, such as Lewis, have shown — without in any sense repudiating the diverse contributions of James, Dewey, and Mead — an increasing tendency to combine, as Peirce had done, their empirical emphasis with the new methodological (as opposed to metaphysical) rationalism developed by the symbolic logicians.

---

1. These are respectively the modern forms of the Stoic-Medieval versions of grammar, logic, rhetoric — all of which were included within Σημειωτικὴ or *scientia sermocinalis*. C. S. Peirce was especially concerned with semiotic. He, more than any other modern thinker, saw its central significance for science and philosophy.

Similar developments have occurred in other countries, so that the program of scientific empiricism reflects an actual historical movement. It is, indeed, simply the philosophic form of the acceptance of the three-faceted temper which the working scientist (as scientist) has long since made his own.

It would seem possible to develop from the standpoint of scientific empiricism a modern form of the older systems of philosophy, in which the traditional philosophic fields of logic, cosmology, and value-theory would find their empirical equivalent. Such an empirical synthesis must, like science itself, be a co-operative enterprise, and its erection will be the work of many generations. But it is important to see the possibility of an empirically grounded philosophical system containing logic, cosmology, and axiology — and to see that such a system is in its ideal form the system of unified science. Philosophy as organon becomes general semiotic; philosophy as system becomes the attempt to work toward the system of unified science; philosophy as vision is the assessment of the social and cultural implications of the system of knowledge available at any time.

The papers collected together in this volume present more a program than the record of an achievement. With the exception of the third, they represent the results of a year of direct contact with European scientific philosophy and philosophers made possible in part by the American Council of Learned Societies, and in part by the University of Chicago. There are repetitions and various loose ends in the papers, but the unity of theme and the temper of the time make it seem not inadvisable to bring them together under one cover. We can make secure advances only by careful and painstaking studies, but it is wise to become aware of actual convergences and of possible outcomes.

In addition to indicating the point of view of scientific empiricism and sketching the outlines of the science of semiotic, the papers provide suggestions bearing upon a number of more specific problems : they contain an interpretatiom of meaning in objective and functional terms, an investigation of the possible uses of the social aspects of communication for building a naturalistic cosmology upon an empirical basis, an analysis of the defects of the historical versions of empiricism, an outline

treatment of the four main stages in the evolution of the empirical point of view in philosophy, and a discussion of the sense in which the formal sciences can be regarded as part of the empirical science of semiotic without denying the distinction of analytic and synthetic propositions.

The temper of the age is ripe for synthesis. The question is as to whether this synthesis will be an emotionally toned reversion to past syntheses or whether the combined work of scientists and philosophers can help to build a new type of synthesis on the basis of science, a synthesis intellectually and practically consonant with present-day achievements, demands, potentialities, and aspirations.

It might be added that, with minor exceptions, the following articles have been reprinted as they originally appeared. The logical positivists — who now prefer the term " logical empiricism " — have continued to develop, and some of the points made and the terminology used in the papers no longer apply exactly to the present situation. But in my opinion these changes are themselves in the direction of the position taken in this pamphlet. For the present stage of discussion reference may be made to the following articles : C. I. Lewis, " Experience and Meaning ", *Philosophical Review,* 1934 ; M. Schlick, " Meaning and Verification ", ibid., 1936; R. Carnap, " Wahrheit und Bewaehrung ", *Actes du Congrès International de Philosophie Scientifique,* IV (Hermann, Paris, 1936); R. Carnap, " Meaning and Testability ", *Philosophy of Science,* 1936.

I. PHILOSOPHY OF SCIENCE AND SCIENCE OF PHILOSOPHY[1]

It is proposed to examine the consequences which ensue if philosophy is deliberately oriented around the methods and results of science. That such reorientation has been more or less unconsciously taking place for centuries is evident; the problem demands particular discussion at this time only because the reorientation has gone so far and with such success as to challenge seriously certain past conceptions of philosophy and to demand of philosophers what, if anything, is left for them to do. For present purposes the revolution indicated will be regarded as a *fait accompli*, and the sole concern will be with what alternatives remain open. The conclusions differ from those of certain others who accept the same *fait accompli* only in believing that more alternatives do in fact remain open than they envisage.

We begin then by rejecting any conception of philosophy which regards philosophy as proceeding by methods other than those of science or as obtaining an order of certainty different from that obtained by science. This is essentially the same thing as to deny the existence of a priori synthetic judgments and any philosophy which rests upon the affirmation of such judgments. If the thesis of physicalism be sound (the thesis that all propositions are intersubjectively verifiable, and translatable into the language of physics) then the accepted standpoint could be simply and literally characterized as the denial of meta-physics, i.e., of any science other than physics. Or putting the case positively, we might say that propositions in philosophy as in science are to be accepted to the degree that they are supported

1. Reprinted from *Philosophy of Science*, vol 2, July, 1935.

by existing evidence and controllable in terms of further evidence.

It might seem with the acceptance of such a position that philosophers are left without employment, for each of the three dimensions of meaning already appear to be in other hands : the mathematician and symbolic logician have taken the domain of formal or syntactical meaning for their own; the artist and men of affairs seem to be charged with the value and directive aspect of symbols (pragmatic meaning); the scientist has made himself responsible for stating what meanings do in fact hold of things (the empirical dimension of meaning). The philosopher who does not wish to lapse into silence or to turn historian must either justify his entrance into one of the three dimensions of meaning (formal, pragmatic, empirical), or must function in some integration of these dimensions. Let us examine these possibilities in turn.

I. *Philosophy as Logic of Science.* The narrowest of the open possibilities would be to identify philosophy with formal logic, so conceived however that this in turn becomes identical with the logic of science. It is this step which Carnap has in essentials taken. For him logic is " the last scientific ingredient of Philosophy; the extraction leaves behind only a confusion of non-scientific, pseudo-problems[1] ". Logic is in turn conceived formally, that is, as dealing with the syntactical structure of actual or possible languages (designated as descriptive or pure syntax respectively) in abstraction from both the empirical and pragmatic aspects of meaning. The results of logical analysis will themselves be expressed in terms of the two kinds of propositions found in science : thus they will either be analytical propositions and so fall within the formal sciences, or they will be synthetic propositions and so fall within the empirical sciences. Thus philosophy as " the syntactical analysis of scientific language "[2] eventuates to be sure in propositions, but these propositions are themselves scientific propositions, so that there are no propositions

1. *Unity of Science,* 22. A useful survey in English is found in *Philosophy and Logical Syntax.* In German a survey is given in *Wissenschaftslogik,* and a detailed presentation in *Logische Syntax der Sprache* [soon to appear in English].

2. *Philosophy and Logical Syntax,* 7. Cf., *Philosophy of Science,* vol. 1, 1934, 9; *Erkenntnis,* vol. 2, 1932, 238.

over and above the propositions of science. Philosophy is formal logic, which in turn is the pure or descriptive syntax of the language of science; philosophical analysis is logical analysis. The result is that " the method of logical syntax, that is, the analysis of the formal structure of language as a system of rules, is the only method of philosophy [1] ".

One aspect of this view deserves to be stressed, namely, the identification of logical analysis with the analysis of " the formal structure of language as a system of rules ". This means that abstraction is made from the relation of symbols in a language to empirical objects and from all psychological and social effects of the symbols. This exclusive attention to the formal dimension of meaning is connected with a conviction that the two neglected dimensions of meaning fall within the province of the empirical sciences. The consequence of the abstraction is that philosophical analysis makes no empirical assertions about non-linguistic objects [2], and indeed makes no assertions about language other than those about the syntactical structure of actual and possible languages. Thus the tendency has been to replace more and more the earlier tests for meaningfulness [3] by purely formal requirements. The content of a proposition is regarded as all the propositions which can be derived from the proposition in question by the transformation rules permitted in the language under consideration [4]. In general, philosophical activity is concerned with the formal consideration of concepts and propositions. In the case of verification, " the logical analysis of verification is the *syntactical* analysis of those transformation rules which determine the deduction of observation sentences [5] ". Similarly, the philos-

1. *Philosophy and Logical Syntax*, 99.

2. *Philosophy and Logical Syntax*, 72.

3. Thus, *Erkenntnis*, vol. 2, 1932, 236 : " Ein Satz besagt nur das, was an ihm verifizierbar ist. "

4. See especially the statement on pages 56-57 of *Philosophy and Logical Syntax*. Cf. *Philosophy of Science*, vol. 1, 1934, 12. The implication of this shift for the problem of truth is obvious : it involves passing from a correspondence view to a form of coherence view, i. e., a true proposition is simply one compatible with or unifiable with the accepted propositions of a science. The evolution in the views of truth is discussed in an article by C. G. Hempel, " On the Logical Positivists' Theory of Truth ", in *Analysis*, vol. 2, 1935. This shift is the price paid for neglecting other aspects of meaning than the formal when certain difficulties in the earlier empirical formulations of meaning were encountered.

5. *Philosophy and Logical Syntax*, 83. Cf. *Unity of Science*, 25.

opher-logician says nothing about nature, since that is the province of the scientist, but is concerned only with the language which the scientist uses about nature [1].

A natural first reaction to such an attempt to find " an exact method of philosophy " is the feeling that the price paid for exactness is too high. It turns out, however, that the field is much more extensive than would at first be suspected, and I do not see how anyone can follow the discussions of formal meaning, of the place of rules in determining formal necessity, of the multi-valued logics, of the foundations of mathematics, of physicalism and the unity of science, without being both impressed and thankful. Nor can it be doubted that the identification of philosophy with the logic of science would give to philosophy a place of significance which would keep it in the closest relation to science and yet not obscure its own function. As a minimal definition of philosophy it is ingenious, excellent, and praiseworthy. The important question is not whether philosophy can do less than fulfil this rôle, but whether it can also do more. To make this " more " initially plausible, one comment may be added. If the syntax of a given language is studied, the resulting statements are empirical and in the last analysis fall within the science of linguistics, while if the syntax of a proposed language is studied in a form such that the resulting statements are analytical, the work of the philosopher is hard to distinguish from the mathematician, and in any case does not result in really saying anything about anything. If the philosopher is thus bound to trespass upon either the domain of the natural scientist or mathematician, why be too squeamish at the start in trying to define the function of the philosopher over against the scientist, since in the end philosophy and science will be found to overlap [2].

II. *Philosophy as Clarification of Meaning.* The most natural extension of this minimal definition of philosophy would be to

---

1. *Philosophy and Logical Syntax,* 84.

2. This is particulary true if it be recognized that the formal sciences are merely a part of empirical science. Although analytic and synthetic propositions may be distinguished, the determination of the status of a given proposition or the determination of what propositions really do follow from others according to specified transformation rules is of course empirical in that observation upon symbols is involved. See my article, " The Relation of the Formal and Empirical Sciences within Scientific Empiricism, " *Erkenntnis,* vol. 5, 1935 [Here reprinted].

apply the method of logical analysis to all concepts and to all dimensions of meaning. As to the first point (the extension to all concepts), Carnap at times suggests that his conception of logical analysis covers " all assertions of science and of everyday life[1]. " But actually he does very little with the latter assertions and can do very little because the assertions of daily life are shot through and through with judgments of value, and these are for Carnap technically without meaning. The instance is given that the statement " Killing is evil " is a command in misleading form, and that no deductions about future experience are possible from it[2]. Now this is obviously a cavalier handling of complicated questions, because it is not impossible that judgments of value are, as Hume suggested, a species of judgments of fact, — indeed it is precisely such questions that logical analysis should be able to determine. It is not surprising that other persons, such as Lewis, have been able to write that " philosophy has for its task such analytic depiction of the a priori, — to define the good, the right, the true, the valid, and the real[3]." On such a view philosophy is still logical analysis, but the tone is not so formalistic, the range of concepts and propositions considered is wider, and the interest in meaning is wider than the interest in formal meaning. This conception of philosophy as furnishing and applying a method for the clarification of ideas has been of course continuously represented in American pragmatism from its origin to the present. It is also championed vigorously at the present by one wing of the *Wiener Kreis,* especially by Wittgenstein, Schlick, and Waismann. Wittgenstein, in a passage in the *Tractatus* quoted too often to need repeating, has spoken of philosophy as an activity. Those influenced by Wittgenstein stress the view that this philosophical activity does not issue in propositions : philosophy is not a science nor an attempt at the synthesis of the sciences, but is simply a process of conceptual and propositional clarification. Thus in theory the interest in this group is not so strongly centered around science or around formal logic, though of course the actual relation of the members

1. *Philosophy and Logical Syntax,* 8.
2. *Ibid.,* 24-25.
3. " Logic and Pragmatism, " *Contemporary American Philosophy,* vol. 2, 48.

to these fields is very close. The interest is rather in taking an unclear concept or proposition, considering it in relation to various usages and situations, making the necessary distinctions which are called for,—until finally the unclarity is resolved. The result is neither a proposition which claims truth nor a proposal as to how words are to be used in the future, but simply the clarification of a difficulty and the return to the unproblematic (a phrase reminiscent of Avenarius, Peirce, and James). Each clarification is a job done, and philosophy will have work to do as long as such clarifications are needed. Philosophy has then no special subject matter about which it aims to communicate truth; it is rather the dimension of ideational clarification present in all reflection. Einstein, for example, was philosophical while he was attempting to clarify the concepts of space, time, and simultaneity. The general result, as Schlick says, will be that in time " no more books will be written about philosophy, but *all* books will be written in a philosophical manner[1] ".

Because of the refusal of members of this group to state propositions which might be construed as the holding of theses, it is difficult to be clear as to what it means to clarify a meaning,—for no general theory of meaning is given. It is perhaps fair to say that as in Carnap's case there has been a shift in emphasis from the empirical aspect of meaning to the formal dimension, but the shift has not been so extreme[2]. Wittgenstein and Waismann no longer stress language as a reflection of the structure of the world of existence but stress rather the central importance of certain relatively arbitrary rules of usage as determinative of the meaning of the term or proposition in question. Hence one hears much of the importance of a " general grammar " and at times a preference for such phrases as " the method of grammatical analysis " instead of the label of " logical positivism ".

---

1. " The Future of Philosophy, " *Proceeding of the VIIth International Congress of Philosophy,* 116.

2. This is especially true of Schlick. See *Les énoncés scientifiques et la réalité du monde extérieur,* 24 (" Bref, l'indication des conditions dans lesquelles une proposition est vraie *se confond* avec l'indication de son sens. Il est tout à fait inutile de chercher plus loin "). His article " Facts and Propositions " (*Analysis,* vol. 2, 1935) is an explicit defense of empiricism against the newer formalistic extremes. In my opinion this resurgence of formalism—empiricism controversies is an evidence that the *Wiener Kreis* has no sufficiently general theory of meaning.

The consequent shift in the center of logic from tautology to rule (as Waismann phrases it) recalls the central place in logic which Peirce had given to "leading principles".

Peirce, however, took a step which I believe it is necessary to take if the alternative now being considered is not to collapse into the first conception of philosophy : he saw that the corollary of an interest in the clarification of meaning was the development of a general theory of meaning, and the conception of logic itself as general semiotic. To take this step does of course mean to state theses, and it does mean that philosophy is brought within the field of the existential sciences, using, like all science, logical analysis in its activity. The reluctance to take this step is understandable, for it seems to lose the neatness of the demarcation of science as statement of fact from philosophy as analysis of meaning. One can perhaps admit that a functional division of labor along these lines is possible, and indeed that it is approached in such distinctions as those between pure and applied mathematics, experimental and theoretical physics (similar distinctions seem to be advisable in all of the sciences). But in general it is difficult to see why a component of all reflection should be singled out as the philosophical component, and certain it is that scientists are not going to turn over the task of determining the meaning of the terms they use to any other group of persons[1]. Too much mystery is thrown around the analysis or clarification of meaning : the meaning of a term is completely specified when it is known what objects the term designates, what expectations it produces in the persons for whom it has meaning, and what its connections are with other terms in the language of which it is a part. The determination of the first gives the empirical dimension of meaning, the determination of the second gives the pragmatic dimension of meaning, and the determination of the third gives the formal dimension of meaning. The point not to be overlooked is that the determination of all these dimensions is an empirical process : the fact that the formal dimension of meaning is not the empirical dimension does not contradict the fact that the deter-

1. If indeed the meaning of a a proposition is all that can be deduced from it by both logical principles and scientific laws the fitness of the philosopher to determine meaning is by no means clear.

mination *of* the formal meaning is itself an empirical process. Logical analysis is itself one kind of empirical analysis, namely, the determination of what we are committed to within the domain of symbols if we allow a certain habit in the use of symbols to proceed, i.e., if we follow a certain syntactical rule. Since this is so, there seems to be little reason for not expanding philosophy into a general theory of symbolism. Unless this is done, and the pragmatic and empirical dimensions of meaning considered on a par with the formal dimension, no significant alternative is presented to the conception of philosophy as formal logic. Otherwise, — silence and the unproblematic!

III. *Philosophy as Empirical Axiology.* Professor Schlick has said that his conception of philosophy is nearest to the old conception of philosophy as " wisdom of life ", — for the sage is the person who sees most clearly the wider meaning of his words and activities[1]. Professor Schlick himself always kept this implication of his conception of philosophy in mind, but by and large his group has looked at science from the point of view of the scientist, and not with the vision of one intent upon the bearing of the scientific attitude and results upon human culture. And here arises a possible conception of the philosopher's task. The resulting conception of philosophy is one which Dewey has made peculiarly his own. It is clear that it would require two lines of development : on the one hand it would be necessary to formulate a general theory of science as an institution and science as a habit of mind, and not to be content solely with a formal analysis of the language of science; and secondly, it would be necessary to elaborate the implications for all the domains of value of the acceptance and extension of the methods and results of science to the widest spheres of human life.

Dewey has been peculiarly sensitive to the instrumental relation of symbols to the life of the individual and the community. He has envisaged intelligence as a tool in the service of some value, and science as co-ordinated and institutionalized intelligence. To him science is rich in potentialities for the control of human life, and for the enrichment and emancipation of the individual mind.

---

1. *Les énoncés scientifiques,* etc., 13-14; *Proceedings of the VIIIth International Congress of Philosophy, 113, 114.*

He is impressed by the gap between the possibilities of this "most potent social factor in the modern world" and the slowness of its extension into the fields where value judgments hold sway. It is in these terms that he can write that "the great scientific revolution is yet to come[1]", and can conceive the task of philosophy today as the extension of the method of freed intelligence into ethical and social domains. And this extension is of course something advocated, and as advocate the philosopher has himself turned moralist. Yet it is important to emphasize the difference between this conception of philosophy and the ordinary systems of admonitions which pass as philosophies of life. In this positivistically toned equivalent of the older conceptions of philosophy as vision, vision has lost both its dogmatism and its fugitive emotionalism and has been tempered by the attitudes and results of science. But in being tempered it has not lost its imaginative character[2]. Here is science crowned by and ministering to social vision. Dewey has written : "One of the few experiments in the attachment of emotion to ends that mankind had not tried is that of devotion, so intense as to be religious, to intelligence as a force in social action[3]." Dewey's own life has been the devotion to that experiment.

Dewey feels that such a conception of the rôle of philosophy is supported by an examination of the rôle it has always performed. To him philosophy has always mediated between fact and value, between "a stubborn past and an insistent future" : "The work of philosophizing," he writes, "is the old and ever new undertaking of adjusting that body of traditions which constitute the actual mind of man to scientific tendencies and political aspirations which are novel and incompatible with received authorities[4]."

To give content to the general doctrine it was required to turn to detailed analyses in various fields of value and contemporary social problems, and to delineate and generalize the essential features of the scientific habit of mind. The latter task constituted

1. *Philosophy and Civilization,* 329.
2. Dewey often states this in extreme form : "Meaning is wider in scope as well as more precious in value than is truth, and philosophy is concerned with meaning rather than with truth" (ibid., 4); "the scientific factor, the element of correctness, of verifiable applicability, has a place, but it is a negative one" (*ibid.*, 10).
3. *A Common Faith,* 79.
4. *Philosophy and Civilization,* 3-4.

Dewey's contribution to logical theory, while his results in the former fields are spread out in numerous books and papers on ethics, esthetics, law, education, religion, and social philosophy. It is clear that the method includes the use of logical analysis of the preceding conception of philosophy, but applies it especially to the analysis of value concepts. And here the pragmatic dimension of meaning is brought to the forefront. The third conception of philosophy thus turns out to be an empirically oriented axiology culminating in a deep concern for the ethical and social potentialities of that type of intellectual procedure which we have come to call scientific[1].

IV. *Philosophy as Empirical Cosmology.* The three views of philosophy we have now discussed (philosophy as *ancilla scientiae,* as *scientia sermocinalis,* and as *ancilla hominis*) present between them non-metaphysical equivalents for the traditional domains of logic and axiology. The question now arises as to whether there is any non-metaphysical (or positively put, any empirical) equivalent to what has usually been called metaphysics (now often spoken of as speculative philosophy)[2]. The first three alternatives present what in a wide sense of the term could be called a philosophy of science, but nothing that could be called a science of philosophy; and they stress the formal and pragmatic dimensions of meaning rather than the empirical dimension.

The ideal of introducing greater exactness into philosophy is an ideal to which lip-service is widely paid. But there are some who feel that serving this ideal does not mean the denial to philosophy of any synthetic or systematic character. Husserl, for instance, does not think the logical positivists deal with genuinely philosophical questions, but that his own phenomenological method supplies for the first time the basis for a scientific philosophy. Peirce, James, Dewey, and Mead have all defended in one way or

---

1. It is not uncommon to find "scientific" philosophers looking down upon Dewey's work. For the most part they fail to see that they are merely dealing with different aspects of science and with different dimensions of meaning. Scientists should not misunderstand those who have accepted science to the hilt, who see its cultural implications, and who are concerned with the existence of a society in which science and scientists may continue to live!

2. The epistemological aspects of the problem are considered in an article, "Pragmatism and Metaphysics," *Philosophical Review*, vol. 43, 1934. [Reprinted in this volume].

another an empirical equivalent to metaphysics in the form of a search for the generic features of all experience. This conception is formulated explicitly in Whitehead's *Process and Reality* : "Speculative philosophy is the endeavor to frame a coherent, logical, necessary system of general ideas in terms of which every element of our experience can be interpreted[1]. " He calls this method the "method of descriptive generalization[2], " and delineates it as « the utilization of specific notions, applying to a restricted group of facts, for the divination of the generic notions which apply to all facts[3]. " The test is empirical : " the test of some success is application beyond the immediate origin." So seen, "metaphysical categories are not dogmatic statements of the obvious, they are tentative formulations of the ultimate generalities[4]. "

It is the fashion of some positivists today to look askance at Whitehead's later work, and I must admit that Whitehead, as Peirce, seems often to desert his method and to talk metaphysics in the sense here rejected. But it must also be admitted that the method proposed for philosophy is simply the hypothetical-deductive-observational method of science, generalized in the attempt to get a system applicable to all experienced reality whatsoever.

The literal acceptance of this method would mean an acceptance for philosophy of the criteria proposed by Newton for science[5]. It would mean that after a merciless process of logical analysis in which pseudo-questions were eliminated, proposed answers to the remaining questions would be evaluated in terms of the evidence at hand, and answers not supported by evidence would be rejected as vain imaginings.

---

1. *Process and Reality,* 4. The term " necessary " is for our purposes unnecessary.
2. *Ibid.*, 15-16.
3. *Ibid.*, 8.
4. *Ibid.*, 12.
5. As given in the *Principia*: "Rule III. The qualities of bodies, which admit neither intension nor remission of degrees, and which are found to belong to all bodies within the reach of our experiments, are to be esteemed the universal qualities of all bodies whatsoever. Rule IV. In experimental philosophy we are to look upon propositions collected by general induction from phenomena as accurately or very nearly true, notwithstanding any contrary hypothesis that may be imagined, till such time as other phenomena occur, by which they may either be made more accurate, or liable to exceptions." Needless to say, Newton did not follow these principles in his own philosophy,—and the results speak for themselves.

If we accept this conception of philosophy as a legitimate alternative, we come in an unsuspected manner to the kernel of truth in the ancient conception of philosophy as the queen of the sciences (*regina scientiarium*). So conceived, the task of philosophy is to erect a conceptual scheme of such generality that it is confirmed by all data. It differs from science in the narrower sense onlyin generality, and not in method nor in the security of the results. Its data is all data, whether found in the special sciences or in the ordinary world of perception and action. Its problems are all problems relevant to the completion of its specific task. Its interest in the clarification of meaning is only in the clarification appropriate to the erection of its conceptual system. On the formal side, the undefined terms of such a system are the categories, and the primitive propositions are those hypotheses whose logical consequences are to be investigated : on its empirical side the system is a cosmology subject to control by all available data. Philosophy as empirical cosmology differs from previous metaphysical systems as science differs from early science, that is, from magic.

The most natural objection to this view of philosophy would be to hold that what has been called empirical cosmology falls within science[1]. This reply is not without force, since it could be held with some plausibility that most, if not all, significant unifications of knowledge have come and must come from below and not from above, from scientists and not from philosophers. But actually this reply begs the question, for if by definition we include all knowledge within science, then it is analytically true that philosophy as distinct from science has nothing to do with knowledge[2]. On this usage it becomes even difficult to see why knowledge of the language of science should in any way be equated with philosophy. It is, however, equally possible to maintain that at the level of the widest system of knowledge the distinction between philosophy and science vanishes : *a unified*

1. See Carnap, *Philosophy and Logical Syntax,* 15-16.

2. It would be interesting to consider cases where philosophers have actually broken ground for science—such as Democritus and atomism; Cusanus and relativity of motion; Leibniz and unified mathematics and science; Peirce, James, Reichenbach and objective indeterminism. The final rejection or vindication of such insights is of course important and laborious—but this should not lead to a condemnation of insights as such, especially when they are of such a type as to be empirically controllable.

completed science and an achieved philosophy would be identical. But until that goal is reached it is possible to distinguish between conceptual systems progressively adequate to specific domains of experienced existence, and the attempts to formulate a system adequate to all domains whatsoever. This does not mean to dictate to science, but to use scientific results and the rich field of common life in the service of the most generalized science, that is, philosophy. At any given time, of course, a philosophy is partial and liable to change, as is any particular science, but there can be no opposition of science and philosophy, and in one case as in another the results are not "vain imaginings," but generalizations empirically grounded and empirically controllable. Philosophy could be as continuous and as progressive as the existing sciences. And at any given time, one could hold with Whitehead that "the useful function of philosophy is to promote the most general systematization of civilized thought[1]," — a systematization that is to be changed or discarded as the evidence demands.

Conclusions. In conclusion a few remarks upon the relation of these four conceptions of philosophy are needed.

First, with reference to the ideal of cognitive certainty, it may be said that the results become less and less certain as we pass progressively from the first alternative to the fourth. In so far as cognitive certainty is taken as the norm, the activities of philosophers should be concentrated upon the fields of work defined by the earlier conceptions. Although this permits work at all levels, it does imply that in general an emphasis upon the logic of science, logical analysis, and a general theory of meaning is desirable at this time.

Second, with reference to other criteria than cognitive certainty diverse emphases are possible. Thus with reference to an individual's special ability or with reference to the special needs of a particular historical epoch other emphases may be desirable. In the present, for example, it could be plausibly argued that philosophy should take seriously the ethical and social responsibilities which conception three demands.

Third, to some persons the view of philosophy discussed in

1. *Process and Reality,* 25-26.

connection with Dewey may seem at odds with the other theories since it has an element of practicality and concern for social issues absent in the others. If indeed "vision" is something simply added to knowledge, it would be understandable why philosophers devoted to science should question this additional step. If ideas are only descriptions this questioning is defensible, but if ideas do function as predictions, if they do have irreducibly a pragmatic or action dimension, then philosophic vision is not different from scientific prediction, but is simply the most general expectations appropriate to a system based upon all the data at hand. Philosophic wisdom is merely the wisdom accompanying the widest knowledge. Science reveals no absolute break between theory and practice, and there is no clear reason why the situation should be different in philosophy[1]. Meaning at the level of philosophic generality has its pragmatic dimension just as have the meanings at other levels. It is important to distinguish dreams and fancies from expectations and proposals based on whatever data is available and controllable by new data obtained in use. It would be a signal instance of ethical irresponsibility to relinquish the demands which the need for a philosophically disciplined imagination imposes, and to turn the world over to the exclusive control of dreamers, adventurers, men of action, and technicians. All choices of rules for action can best be made in terms of the purposes to be effected and the data to be considered. The philosopher aware of social responsibilities is simply carrying out on the widest scale the same type of action which the logician exemplifies in the selection of rules of operation, and which the scientist illustrates within a particular domain in his search for the conceptual system most adequate to the facts at hand and to the most exact determination of expectations as to the future. Philosophy is the most general science and the widest vision, — and the one because it is the other.

Fourth, it is important to note that the first, third, and fourth views, often wrongly considered as mutually exclusive alter-

1. "Whatever is found in 'practice' must lie within the scope of the metaphysical description. When the description fails to include the 'practice,' the metaphysics is inadequate and requires revision..... Metaphysics is nothing but the description of the generalities which apply to all the details of practice." *Process and Reality,* 19.)

natives, deal with complementary and not opposed aspects of the meaning situation. The implication of this fact is that *formalism, empiricism, and pragmatism are complementary phases of the scientific temper.* I propose to recognize this fact by designating the implied philosophical attitude as *scientific empiricism*, the term "empiricism" indicating the acceptance of concepts and propositions in proportion as they are based upon and controllable by evidence, and the term "scientific" suggesting not merely that science is the recognized focus of orientation but also that whatever formalistic, pragmatic, or cosmological factors are operative in the scientific enterprise are compatible with this version of empiricism. The proposed formulation thus accepts and reconciles all four of the previously considered conceptions of philosophy. It should not be impossible that with the passage of time and with the acceptance of the co-operative responsibility which the program of scientific empiricism entails present philosophical theses (such as the defense of realism) will compare with the future status of such theses much as Greek atomic theory compares with the atomic theory of the present time.

Fifth, each of the three dimensions of meaning has developed its own typical form of expression : mathematics is the language of possibility, science is the language of fact, art is the language of value. Philosophy may in turn be looked upon as the language of languages. This expression itself has a double aspect : it suggests a language about languages, and in this sense philosophy is general semiotic (general theory of symbolism); it also suggests the most comprehensive of languages and in this sense philosophy is general science, and possesses the values which go with such generality. When the phrase is so understood, all four of the conceptions previously considered are incorporated in the conception of philosophy as the language of languages.

II. THE CONCEPT OF MEANING IN PRAGMATISM AND LOGICAL POSITIVISM[1]

I

The empiricist temper receives its most vigorous contemporary expression in the writings of the American pragmatists and in the writings of those who have been stimulated by the influences which have spread out from Vienna as a centre. For convenience sake, these movements will be designated as pragmatism and logical positivism. Pragmatism distinguishes itself from English empiricism by its emphasis upon biological and social categories (it is not falsely described as a biosocial positivism), while logical positivism is characterized by its utilization of logical (or syntactical or grammatical) analysis. The main figures in the two movements indicate the divergent directions through their own scientific affiliations: in the main the pragmatists have had close contacts with the life sciences, while the logical positivists bear the imprint of the mathematical and physical sciences.

Both the logical and biological poles were implicit in English empiricism, as will be recalled by the bare reference in Locke, Hume, and Mill to the category of habit on the one hand, and to the somewhat confused recognition of the analytic nature of the formal sciences on the other. The two contemporary developments have, as it were, brought these two poles into the focus of attention as a result of the perhaps one-sided contact with the later developments of the biological and the mathematical-physical sciences. Just as the English empiricists failed to satisfactorily integrate the two emphases on the logical and the biological, so it

---

1. To appear in *Proceedings of the Eighth International Congress of Philosophy* (Prague).

may seem as if the two contemporary forms of empiricism simply illustrate in a more indecent fashion this basic unclarity which has haunted the historical empiricisms. Nevertheless, it is the contention of this paper that the two movements are essentially complementary, and that much is to be expected from a conscions cross-fertilization of the two tendencies.

The more immédiate founders, Peirce and Mach, had contacts with both the biological and the mathematical-physical sciences. While it is true that in the further development pragmatism became especially sensitive to the life sciences and logical positivism to mathematical logic and physics, it is clear that today both groups are increasingly recognizing the importance of considerations they have lately tended to neglect : pragmatism is attempting to extend its position into the field of the formal and physical sciences; logical positivism shows more and more recognition of the pragmatic context in which languages — including the formal languages — operate. The time is appropriate for more direct contact and cooperation between the movements. After a period of divergence from a similar starting point, the circle is again tending to close. There arises the promise of an empiricism able for the first time to explicate convincingly the relation between the logical and the biological.

The two major needs of pragmatism are systematization and a more adequate treatment of the formal sciences. Both in method of treatment and in obtaining access to an elaborated body of material in the formal and physical sciences, pragmatism has much to gain from its European cousin. In return, pragmatism can offer its store of socially and biologically oriented analyses of such concepts as "mind", "consciousness", "self", "truth", "symbol", and can perhaps aid logical positivism in doing justice to the full range of interests which have generally characterized the activity of philosophers by saving it from the scholastic spinning of webs which a too narrow concern with the logical analysis of a restricted set of meanings might tend to encourage.

II

The concept of meaning provides the central basis upon which to discuss the present differences and the tendencies toward co-operation which the two movements reveal. Meaning shall

here be considered only in the sense of signification and not in the sense of significance. Within this limitation it is convenient to focus attention upon two sets of problems : 1. the degree to which meaning and truth are individual or social, 2. the relation of the formal and empirical aspects of meaning. It is around these two problems that the discussion will revolve.

It is evident that the pragmatic emphasis upon the social aspects of meaning and knowledge contrasts with the more individualistic flavor of the Viennese group and with the latter's consequently narrower definition of the meaningful. The earlier versions of logical positivism tended not only to equate the meaningful and the verifiable, but to suggest that verifiability demanded that the object meant be capable of appearing in "my" experience, at least "in principle". There is clearly an unexamined individualistic hangover in the questionable passage from the view that a proposition is to me meaningful only when I am able to state the conditions under which it would be true or false, to the view that those conditions must include my presence. Strictly carried out, it would follow that at most we can know only what is expressed in the proposition being directly verified, and can only mean that which is directly experienced by myself. I could not mean, let alone know, that I was born, that the world will go on after my death, that objects exist which I do not perceive, or that objects which I do perceive now have other aspects which I do not perceive —for in none of these cases can the proposition be verified, even "in principle", by the appearance in my experience of the object in question.

These consequences, fatal in my opinion, did not bulk so large in the actual course of thought as did the fact that scientific laws, involving in their generality a reference to past and future, and to a plurality of observers, were on the proposed criterion ruled out as meaningless, a consequence hardly acceptable to thinkers who were attempting to formulate the logic of science. It seemed as if science was to be embalmed rather than clarified. Indeed, in no significant sense can the intersubjectivity which science as a social process demands be brought without residue within the field of one subject's experience. A theory of the meaningful as the "verifiable by me" is acceptable neither to science nor to common sense.

Before noting the reformulation given by the logical positivist, it may be well to consider the way in which pragmatism had approached the problem. Due to its recognition of the action context in which symbols function, pragmatism took a slightly different road : meaning was in effect stated in terms of the expectations aroused by the object functioning as a symbol, and not in terms of the verifiable as such. Verifiability was taken as the criterion of truth and not of meaning. But here too a complication appears : even if one passes over the fact that "expectation" seems to have an individualistic ring, it might appear that knowledge must coincide with what is verifiable by me—a result equally at odds with the intersubjectivity of scientific knowledge. Gradually, and not yet completely, pragmatism sought to avoid these difficulties by recognizing the social nature of scientific meanings and knowledge.

Seen in terms of the context of social behavior, meaning always involves a set of expectations aroused by the symbolic functioning of some object, while the object meant, whether past, present, or future, and whether confrontable by a particular person or not, is any object which satisfies the expectations. A self, as a social being, can for instance expect that other selves will verify its own expectations (a situation of constant occurrence in science), and in this sense at least meaning can outrun personal verification.

The question may be raised as to whether meanings not verifiable completely by a specific individual fall within the knowledge of that individual. Does "verifiability" permit of a social dimension? In answer, it must be stressed that whatever the traditional epistemologist chooses to say, the term knowledge, in normal usage, applies to an ill-defined segment of the domain of meaning. Verification is in general a matter of more or less, and in scientific usage the term knowledge includes all those meanings which through the social process of verification have come to act as relatively stable points of reference in scientific procedure.

The points at issue will become clearer if we consider the following situation. Let us suppose each person of a group to make a list of the propositions which he verifies. A study of the lists shows that some propositions appear in all lists, and such a proposition we now define as an objective truth. Other propositions appear in some of the lists, but not in all, and in proportion

as this is so there is a numerical measure for the degree of objectivity of knowledge. There is also a special class of propositions in which the subject of each proposition is the owner of the list himself. Here too we find a special type of intersubjectivity which may be called objectively subjective truth : while a proposition with a particular subject is found only in the list of that subject, that same proposition concerning different subjects is found as verified in the list of many or all of those subjects. Here is an intersubjectivity concerning what is private; the visual figures which appear in migraine and epilepsy may serve as an example. Finally, there are propositions found in one list but not in others, and such propositions have what may be called subjective truth.

In these terms one could construct a series of propositions beginning with those whose knowledge status is subjective, passing through those which are intersubjective truths about private experiences, to those which are fully objective or intersubjective. The order can be more minutely determined though quantitative indices added to the propositions, and through indices giving the reliability of the individual reporting the proposition expressed in terms of the usual degree of objectivity of his propositions. And still other refinements are possible into which we do not need to enter. In such a list of propositions it is clear that there is no absolute line of demarcation to determine when a proposition is to be given an honorific status in the domain of knowledge. One can only say that a proposition is objectively true (or "really" true) in proportion to the place it occupies in the series of propositions. And since the list is never completed, there can be no certainty that the rank of any specific propositions will henceforth undergo no change.

This expanded pragmatic view of meaning and knowledge, though it saves logical positivism from its air of paradox, and relinquishes the hard and fast line between the unverifiable and the verifiable, and between hypothesis and knowledge, does not lose the significance of these distinctions nor lose what is essential to the polemical aspects of the movement. It continues to make the distinction between meaning as signification and meaning as significance; it opens no door to a metaphysics which proceeds by methods or data other than those of science; it relaxes in no way the responsibility of the individual to put all meanings

possible to the test and to distinguish what he himself verifies from what others report as verified.

We can now turn to the second aspect of our problem : the relation of the logical and the empirical aspects of meaning. While some logical positivists have moved from their original position to essentially pragmatic views, and while a widening of the criterion of the meaningful is everywhere evident, the general tendency has been to pass from the empirical context of meaning and the empirical problems of verification to a formal or logical or grammatical definition of the meaningful. The significance of this turn, and its relation to the preceding considerations, must now be clarified.

The general direction of the change is clear. Instead of talking about "expectation", of "verification through the appearance of the object meant", of "the qualities an object must have to be designated by the symbol", the meaning of a word is considered to be constituted by the syntactical rules within a given speech which determine its usage, and the meaning of a proposition similarly becomes the non-analytic propositions which logically follow from it, i. e., which the syntax of the language allows. Problems as to the meaning of symbols become transformed into problems of syntax. Thus, if the previous language of the logical positivist ruled out the laws of science as meaningless, and if it serves our purposes to regard these laws as meaningful propositions, it is only necessary to adopt a new language which permits the symbol combinations in questions, i. e., which permits the use of "the unrestricted 'all'-operator". And since an individual cannot be compelled to accept rules, the result seems to be an individualistic formalism at variance with the social positivism of pragmatism. Analysis shows, however, that this apparent divergence is largely illusory, and that where this is not so, the formalistic approach reveals certain inadequacies which need to be pointed out.

The formal and the biological-empirical aspects of meaning are essentially correlative and complementary ways of reading the meaning situation. Meaning is not an event but a functional process, and the usual definitions of meaning are but ways of designating the same situation from different points of view. Symbols have three types of relation : to a person or persons, to

other symbols, and to objects; meaning has three corresponding dimensions or meanings, namely the biological aspect (meaning as expectation), the formalist aspect (meaning as that expressible in a particular speech), and the empirical aspect (meaning as functional substitutability for objects). It will be found that the attempt to state the full nature of meaning from any one point of view leads to the almost unconscious introduction of the other points of approach, so that a type of translation is possible from one account to the others. Thus if we say that the meaning of a symbol is the expectations it arouses, this is practically equivalent to saying that the meaning of a symbol is its possible extension (i. e., all the objects to which it can be applied), and this in turn is similar to saying that the meaning of a symbol is determined by the specification of those characters which an object must have for the symbol to be applied. And then since these characters must in turn be specified by the use of other symbols, we find ourselves led to the formalistic position that the meaning of a symbol is determined by its syntactical connections with other symbols (i. e., by the grammatical rules of its usage). Expectations are of objects (using this word in the widest sense), and objects enter the meaning relation only as they answer to expectations, so that an account of meaning in terms of "expected objects" can always be phrased in terms of "objects expected". It is true that there is not always an actually existent object for every expectation. Hence it is not always possible to pass from statements concerning expectations to corresponding statements about actual objects. But it is always possible to pass from a reference to objects to a statement in terms of the symbols which are the vehicles for this reference. Stated in other terms, while intension and actual extension are not everywhere parallel, every statement may be made either in terms of possible extension or in terms of intension, and the intensional formulation can be given through the interrelations of the symbolic vehicles rather than through the biological and psychological context.

The limitation of formalism is that we cannot work in the opposite direction : we cannot determine what is materially true through a consideration of possible symbolic usages, if for no other reason than that with suitable selections of rules

all symbolic usages are possible. A complete formalism, if it were possible, would also rule out all science, since it would say nothing. Thus while all that can be said can be translated into a formal statement in which abstraction is made from the empirical references of symbols, in so far as knowledge is concerned the movement can only go from the empirical relations of symbols to the formal relations, and not vice versa. Knowledge permits no abstraction from the empirical relationships of symbols to objects. The formalist can only propose or analyze languages; what is found to be true of the world when a particular language is used falls outside of his province.

Further, it does not follow that at each moment all that is said can be said in the formal mode of speech. When we formulate the rules of an existent language we are referring to that language; when we choose rules of operation for a constructed language we must understand in a non-formal sense what operations the rules permit. In both cases we can later formulate the rules themselves in formal terms, but only by using language not itself at that moment in the purely formal mode. Similarly, we can talk about the relation of a language to what lies outside of the language. What we say, however, is again language and may be formally regarded in terms of syntactical rules; and these rules themselves, together with questions of their genesis, their suitability to purposes, and the like, again become new objects which we can think about, that is, refer to by new symbols. In all cases of verification, i. e., wherever truth enters, we must in fact continue to use symbols in the non-formal mode; must continue to expect and to observe whether our expectations are or are not confirmed through the occurrence of what is expected.

Neither the formal nor the empirical mode of speech is to be given any wholesale preference over the other. Both have their advantages and their disadvantages. Where they are not alternative formulations of the same fact, they are complementary formulations of two aspects of the complex meaning situation. Recognition of this result would give pragmatism the occasional advantages of the formal mode of statement, and would give to logical positivism that which is necessary in order to avoid the sacrifice of its positivism on the altar of its logicism.

Thus in spite of apparent divergences and real differences of emphasis, it is possible for pragmatism and logical positivism to converge on an analysis of meaning which is wide enough to include the results of socially co-operative science, and to do justice to the logical, biological, and empirical aspects of the symbolic process, and yet narrow enough to exclude from claims to knowledge those expressions which are meaningless, i. e., logically stated, which are governed by no rules of usage; biologically and empirically stated, which determine no expectations subject to verification.

III. PRAGMATISM AND METAPHYSICS[1]

I

We wish to be as realistic as it is possible to be and still talk sense, but we do not know the limits of meaningful discourse,—such I take it is a fair expression of the temper of many philosophers today. This plight is a result of the meeting of two of the deepest needs and impulses which man has shown: the desire to avoid being bamboozled, expressed by attempting to put all speculation to the test of confrontation with what is talked about; and the demand for an object of devotion and of knowledge in some sense independent of and more stable than oneself as knower and actor.[2] The man on the street has no doubt as to the existence of objects unperceived. The individual scientist demands the right to call every theory before the bar of his experience, and yet he insists that knowledge be of objects which others can confront as well as he. Morality demands novel and creative action, but also a cause which transcends the individual. The most empirical philosopher does not hesitate to take out a life-insurance policy or to refer to the never-again-to-be-given event of his birth. Life reveals a rhythm of the demands for adventure and for security which thought itself mirrors. The whole history of ideas illustrates the clash between the intellectual asceticism of empiricism and the intellectual lustfulness of metaphysics, between those who wish to talk sense and those who wish to talk about something

1. Reprinted from *The Philosophical Review*, vol. XLIII, 1934. The article could better be entitled "Positivism and Naturalism". The term "metaphysics" was not wisely chosen.

2. In my volume, *Six Theories of Mind*, there was, for instance, no genuine reconciliation of the positivistic and realistic strains which run throughout the argument. The present paper, in suggesting such a reconciliation, helps to complete the argument of the book. The clash between positivistic and realistic motives is evident throughout the entire history of Greek, medieval, and modern empiricism. The empiricist is usually a realist with a bad conscience—and scepticism is the clinical symptom through which the malady takes visible form.

other than themselves and their world. Philosophers cannot help but ask as to the relation of these two motives, positivism and metaphysics. Since at least no philosopher will admit that both are to be strangled, the question is whether one should be sacrificed to the other, or whether perhaps both are capable of a healthy life. Certainly it is to be hoped that an empirical realism is not a contradiction in terms.

The logical positivist has seemed to tell us that metaphysics is meaningless, but it turns out that he is meaning by metaphysics something akin to the Bergsonian view of metaphysics as a science dispensing with symbols (a view which certainly is not attributable to most of the historically eminent philosophers), or to the view of metaphysics as a non-empirical science of things-in-themselves, while he himself is careful to leave us intact as much of a world as science demands, simply substituting *Weltlehre* for *Metaphysik*. The logical positivist of Carnap's stamp[1], in the endeavor to build upon the basis of what is given, holding that a concept is meaningless which cannot without remainder be resolved back into propositions about 'my' experience, is forced to the conclusion that epistemologically the intersubjective world which science demands can be only 'inter' the subjects constructed in 'my' experience, so that intersubjectivity collapses into intrasubjectivity of a rather complicated sort. The logical positivist's tools have not yet been adequate to the task.

It might appear as if all positivism would have a similar fate. Pragmatism as biological positivism may simply seem to get into deeper water by orienting meaning around behavior, while its stress upon the social might appear only to draw the net tighter around the human scene. I shall suggest, however, that its theory of meaning and intelligence is wide enough not to make metaphysics (as cosmology) meaningless, while narrow enough to exclude any metaphysics which does not frankly admit that it has no method other than the one science employs. It is able to do this, the argument will run, precisely because it has taken seriously the restriction of knowing to problematic situations, and has recognized the social aspects of minds, meaning, experience,

1. At least the Carnap of *Der logische Aufbau der Welt*. See especially sections 140-149.

and knowledge. Whether its stress on the social as a category issues in a social positivism, or whether it permits of a meaningful realism which affirms the existence of objects independent of all experience, remains to be seen.

II

Let me first call attention to the fact that pragmatists do have more of a metaphysics than some of them have wished to believe. Peirce, whose program is really a logical positivism, was equally — though not always consistently — a realist, idealist, and pragmatist; while his follower, C. I. Lewis, who states that " beyond the possibility of experience " is " beyond all meaning[1] ", is yet willing to say that the belief in other minds " transcends the possibility of verifiable knowledge and can be founded only on a postulate[2] " — a postulate which is presumably meaningful. James's finite God was certainly regarded as independent of the relation to human experience; and James, thinking of himself as a systematic philosopher[3], criticized the Chicago school for its lack of metaphysics. Even that lack hardly now exists. One cannot read Dewey's *Experience and Nature* without taking the realism quite seriously : mind emerges out of a prior level of life as that in turn emerged from a physical level. Though in experience the tops of peaks appear, their bases lie far below what is given for immediate observation. Mead, in a 1926 seminar, held that Dewey had not shown that his view of meaning entitled him to such a doctrine of emergence. Can there be, he asked, a meaningful inquiry as to the conditions of experience itself on an experimental theory of meaning? Must not a serious

1. *Mind and the World-Order*, 417.

2. *Ibid.*, 409. See also " Logic and Pragmatism, " *Contemporary American Philosophy*, II 50.

3. James's *Letters* reveal how strongly he thought of himself as a systematic metaphysician. He constantly lived in apprehension that he would die before he could finish his system. His letters also reveal his struggle between a strict positivism and a realism, and his doctrine of pure experience may be regarded as the resulting compromise. " I am a natural realist " he writes on August 5, 1907. He recognized over-beliefs for what they were, but certainly regarded them as meaningful. He praises the " concept of permanently existing things " and the " category of trans-perceptual reality " (*The Meaning of Truth*, 63-4), and makes it clear that pragmatism is " epistemologically realistic " both as to permanently existing objects and as to the past (*ibid.*, 88). He states that radical empiricism can include " any amont of empirical reality independent of the knower ", *ibid.* (100 n.).

empiricism hold that the lower levels are themselves simply abstractions from the complex ones[1]?

Yet, while Mead's thought has moved cautiously around these danger-points (especially in his theory of the past[2]), his own position reveals a similar situation. He was asked after the Carus Lectures why his " present " does not logically fall into the Eternal Present of certain Italian idealists, and he replied : " Of course I have a plurality of presents. " Of course he has, but one might still ask how on an empirical theory of meaning one is to give meaning to the phrase " other presents ". While Mead himself holds that the past, as the past-of-a-present, naturally varies with each present, and functions in the reconstruction of that present rather than in recapturing an absolute past, he also writes more than once that reality is a passage of presents[3] — and such previous presents, though not pasts-of-a-present, are, the realist would certainly say, past in the perhaps radical sense of passed[4]. Mead is a little uneasy here, as any attentive reader will note; he wishes neither categorically to affirm nor to deny the meaningfulness of the conception of such previous presents; he merely states that such a conception has no place in scientific considerations about the past, and that if introduced at all it is due to " theological or metaphysical " considerations. His more cautious views seem to issue in what could be called a social positivism; we can transcend any particular experience but never experience *in toto*. " If mind is simply an emergent character of certain organisms in their so-called intelligent responses to their environments, mind can never transcend the environment within which it operates. Nor can it by generalizing all possible experiences get beyond any possible experience; for it must do its thinking within some experience.... [5] "

It would be much to go even this far, for it would clearly establish the scientific demand for a theory of knowledge permitting

---

1. And again, " In what sense shall we speak of the nature which existed before the advent of man? Dewey does not deal adequately with this problem.... Dewey has not sufficiently dealt with the whole difficulty of emergence. "

2. *The Philosophy of the Present*, chap. i.

3. " The actual passage of reality is the passage of one present into another " (" The Nature of the Past ", *Essays in Honor of John Dewey*, 235).

4. See E. B. McGilvary's article " Perceptual and Memory Perspectives ", *Journal of Philosophy XXX* (1933) esp. 328 and n. 17.

5. *The Philosophy of the Present*, 118.

statements of high universality, applicable to any experience whatsoever, aud yet would never saddle science with the task of riding an unexperienceable steed. It would thus meet to some degree both the positivistic and the realistic demands of thought. Nevertheless, the question remains whether this account does or does not regard the problem of the origin of experience itself as meaningful. Not merely the assertion that reality is a passage of presents is relevant here, but also the fact that Mead's task as a social psychologist was to show how mind and the self emerge within a sociobiological process not itself composed of minds or selves but of organisms alone; and it is difficult to keep from feeling that such an evolutionary account must take seriously the implicit presupposition of earlier levels of reality not dependent upon being known or even experienced.

III

Mead's starting point lies in the concept of social experience[1]. Both rationalism and empiricism have historically tended to regard experience as personal, individual, subjective, mental; and the traditionally conceived problem of epistemology was to show how starting from such experience a world of opposite character could be reached. The answer from the Greeks through the English and the Germans and the Viennese is that it cannot be done. The question then must be asked whether the starting point is really demanded. The pragmatist points out here that 'my' has no meaning except over against 'your', that unless there was a social or common dimension of experience the notion of private or individual experience would be without meaning. If the retort is that this polarity may be true of the possessives but that experience itself *is* private, the pragmatist counters with the insistence that the primary situation for observation is a field in which one's self is there on the same level of immediacy as are other selves and physical things. Other selves are not fully given, but that does not mean that they are less truly given. Experience of one's self is always in a field in which other things are experienced, and the self has no method of knowing itself different from the way it

1. The content of the following three paragraphs is elaborated in his as yet unpublished presentation of his social psychology, *Mind, Self, and Society*. [Published, Chicago, 1935].

knows things other than itself. It is within such a field that certain contents (givens, meanings, truths) come to be referred to the self as private or subjective, while others establish themselves as objective and common.

Mead has traced in detail the origin of the self to which the private contents are referred. The distinguishing characteristic of this self is that it is its own object. This in genesis requires that an organism must in some sense be able to get outside of itself, as it were, in order to respond to itself as an object. The mechanism for this development Mead finds in language; in virtue of the co-operative activity in which organisms participate, and because through speech an organism can hear itself talk and so affect itself as it affects others, the organism can "take the rôle of the other", *i.e.,* respond to itself as others would. To the degree that this is so, the egocentric predicament is avoided, since the self as social can take the attitudes of others implicated in the common activity; others, be it remembered, given and known in the same way as any particular self experiences or knows itself.

This process of rôle-taking, like any act, is capable of generalization, and in so far as one takes indifferently one and all the rôles of those engaged in the common activity, one has taken what Mead calls "the rôle of the generalized other". Now the world is common in so far as it appears in a plurality of perspectives. To the degree that statements true of the world given to one self are true of the world given to another, the two selves have common experience, including common givens, common meanings, common knowledge. To the degree that this is not so, the experiences are private. Science is the systematic development of common knowledge, and the scientist's belief that what is known is independent of himself, and indeed of any observer, is explained as due to his rôle-taking capacity and the ability to isolate what is common to or invariant in the various rôles. So conceived, science thus obtains an explanation of the independence of its statements of any individual observer, without relinquishing its other claim that all its theories must be submitted to the test of experience. If one is willing to regard metaphysics with Dewey[1]

---

1. "The Subject Matter of Metaphysical Inquiry", *Journal of Philosophy,* XII (1915) 338.

as consisting in the isolation of even more universal statements — as in isolating the categorical or generic features of all experience — it is clear that metaphysics is entirely meaningful, since it makes no statements not capable of empirical verification.

To round out Mead's account, one other dimension of his theory should be noted [1], a dimension which follows from his instrumentalism, and one which Dewey too has expressly stressed [2]. Since thought is problem-solving, and since problems are specific, there is always an unquestioned unproblematic world which surrounds the problem and in which the hypothesis is tested. As Mead puts it, the scientist is in the position of investigating and repairing some portion of an ongoing process whose existence as a whole he never questions. And for a philosophy which acceps the scientific method as its own, all philosophical problems likewise occur in an ongoing world not placed in doubt. It is in this sense that the pragmatist has opposed the traditional epistemologist (not epistemology, since he himself is concerned with the problem of knowledge), whose neglect of the social or common dimension of experience reveals itself now as the overgeneralization of the sphere of the problematic — an overgeneralization since it in fact never does take place.

Through the mechanism of rôle-taking, and the acceptance of an empiricism with a social dimension, Mead has made intelligible the mechanism by which the individual transcends his own perspective and is able to contrast its private features with the common world which expressed in symbols becomes the world of science. As we have noted, the realistic demand of thought is satisfied without foregoing the equally insistent demand of positivism. At the same time, Mead's instrumentalism prevents the sphere of the problematic from becoming ubiquitous, and it is in this sense that there is no problem of the existence of the world. Traditional epistemology is seen to have arisen out of the failure to recognize the social dimension of experience and to limit the sphere of the subjective or psychical to the focus of the problematic.

---

1. See Part I of *The Philosophy of the Act*, a volume of yet unpublished writings.
2. *Essays in Experimental Logic*, xi. It is also implied by Peirce, "What Pragmatism Is" *Monist* XV (1905), 172.

IV

Let us take the rôles of two opponents to this view. The extreme positivist—who is frequently the traditional epistemologist in disguise—would probably feel that in the strictest sense the position, while positivistic in tone, has insensibly moved beyond what can be empirically tested, and he may say, with a twinkle in his eye, beyond the limits of meaningful discourse. Is not rôle-taking, he goes on, only your (we will overlook his easy use of 'your' and 'mine') imaginative assumption of the attitudes and positions of others, as is evidenced by the facts of mistakes made in the process, so that you get outside of your experience only in imagination? Is not the whole intersubjective world in some sense an imaginative construction in your world? On what ground do you ascribe to others the characters you only directly observe within yourself? Is not an inference involved that is not verifiable by direct confrontation of the fact asserted? Are you not therefore making some sort of distinction between meaning and truth, and relinquishing positivism by trying to talk meaningfully about something which you yourself cannot verify? The metaphysician, whether objective idealist or realist, will take the opposite tack. Getting statements, he will say, about many experiences will in no way answer the question whether objects exist independently of experience or the question as to the nature of such objects. And the two together : Has not the pragmatist tried to avoid the Scylla and Charybdis of positivism and metaphysics by setting up an enchanted half-way isle of social positivism which on approach proves to be neither one nor the other?

The positivist's warning is to be heeded. Pragmatism began as an empirical theory of meaning, and will have lost its identity when that theory is lost. I prefer to state the pragmatic thesis on the topic of meaning in this way : When 'meaning' is used in the sense of signification and not significance, *the meaning of anything whatsoever is identical with the set of expectations its presence arouses*[1]. Expectations are anticipatory responses usually involv-

1. Cf. Peirce's statement : " If one can define accurately all the conceivable experimental phenomena which the affirmation or denial of a concept could imply, one will have therein a complete definition of the concept, and *there is absolutely nothing more in it.*" ("What Pragmatism is", *Monist* XV (1905) 162, 163.)

ing anticipations of the features of the object meant. The object meant — whether past, present, or future — is any object which will satisfy the expectations. No statement can on this view have a place in science or philosophy which does not set up definite expectations, and the truth of any such statement can reside only in the verification through actual experience of what is expected. Find what you expect when you use a concept, the pragmatist must say, and you have exhausted the meaning of that concept.

Nevertheless, it is true that in a sense meaning both antedates and outruns truth. A truth is a meaning confronted by what is meant[1]. If there are no expectations, there is nothing to verify. Seldom, however, does any process of verification verify or test all of the expectations. The object over there is a wall if it has characters *a*, *b*, *c*. . . . Verification consists normally in finding a certain set of the characters to be so, the selection depending on what is relevant to the purpose in hand[2].

The point now to be noted is that among some expectations is the expectation that others will take part in the process of verification. There is thus a social factor in verification which positivists usually neglect. As beings participating in common activities we do in fact find that what others tell us we will find we often do find, and that others report to us what we have expected them to find. This confidence in the reports of others is not dependent on some dubious assumption of a psychophysical parallelism, but is empirically verified[3]. Since expectations have a behavioral com-

---

1. "Expectation is like hunger; it opens its mouth, and something probably drops into it, more or less, very often, the sort of thing it expected; but sometimes a surprise comes, and sometimes nothing" (Santayana, *Scepticism and Animal Faith*, 36).

2. Peirce, James and Dewey essentially agree that meaning consists in the expectations that a sign or symbol arouses, that meaning is wider than truth, and that truth involves the verifications of the expectations by the appearance of what was expected. But James stresses the place of the private, *i.e.*, the expectations as to the effect of the idea on one's life, emotions, etc., while Dewey and Peirce stress the social or common aspects of meanings, the first as ethicist, the second as scientist. Reconciliation arises with the recognition that there are both private and social poles to meaning and truth.

3. This is what is neglected in such individualistic theories of experience as lie behind Russell's statement : "When we are trying to show that there must be objects independent of our own sense-data, we cannot appeal to the testimony of other people, since this testimony itself consists of sense-data, and does not reveal other people's experiences unless our own sense-data are signs of things existing independently of us." (*The Problems of Philosophy*, 33, 34.)

ponent objectively observable, I can observe that you expect what I do upon my use of words, and that the object which satisfies my expectations satisfies yours. Communication is not theoretically postulated but is empirically observable. And then, just as we trust microscopes and telescopes because we can verify the accuracy of magnification in low-power lenses, so we continue to accept the reports of others beyond the field where we too can completely verify those reports, as in the letters of men dead, in the pains of others, and in the reports of others about things not happening to us[1].

The question whether the acceptance of such reports is an increase of knowledge is largely a verbal matter; some might prefer the phrase 'socially grounded belief' or prefer to talk in terms of probability instead of knowledge. If knowledge is defined by a person as the sum of expectations he has himself verified, then of course he does not know that he was born, or that the world will go on after his death, or that others have experience which he does not have. He in fact knows very little, since it is a question whether he now knows that he has made previous verifications, and since he never knows that even the objects before him will continue to meet his expectations of them. But just as an individual normally regards verification as attained when a selected set of specifications are met, so he is convinced of the existence of parts of the world not now given to him and of the former existence of objects that are no more when certain of the expectations set up—including the reports by others—are fulfilled[2]. The broken lock and the report of neighbors verify the belief that some one was in the house, though this some one was not seen by me, and the pictures and articles of writers tell me of countries that I shall never

1. This could be stated in Peircean terms by saying that in the reports of others as well as in the use of instruments we set up leading principles or habits of inference verified over a large domain, and then trusted when exhaustive direct confrontation of the object meant is no longer possible. It is through such a formulation that Peirce can oppose a too narrow interpretation of positivism (*Collected Papers*, ed. by Hartshone and Weiss, II, 308, 309) and yet consistently regard pragmaticism as an extended form of positivism proceeding " by the observational methods of the true sciences" ["What Pragmatism Is", *The Monist*, XV (1905), 171].

2. With the above explanation of the process, one can agree with the view of Ogden and Richards expressed in opposition to Aenesidemus' theory of signs : " There can be no signs of things to which we cannot refer, but things can be referred to which are not experienced. " (*The Meaning of Meaning*, Ist ed., 418.)

visit. All verifications are partial, whether the objects meant are present, or past, or distant in space [1]; and many of them are mediated by empirically grounded leading principles, based on experience with the reports of others and the use of instruments.

It is sometimes said that to argue from 'If *a*, then *b*' and the affirmation of *b*, to the affirmation of *a* is unsound. But the symbolism is inaccurate. Since meaning consists in expectations, the meaning 'Napoleon existed' contains when elaborated the expectations actually fulfilled in historical investigations among its component meanings, so that *b* is as a meaning part of *a*, and *a* is verified to the degree that *b* is a part. The *a* over and beyond *b* may be made smaller by further investigation. It may also be found empirically that *ab* is so connected with *a-b* that inferences from the former to the latter are highly reliable in terms of a frequency theory of probability. Thus, though I cannot confront Napoleon and speak to him (indeed to do so would refute my claim that he exist*ed*), I can directly verify much of what is meant by the proposition 'Napoleon existed' and the part so verified is connected with the part that is not through empirically certified leading principles. Since judgments about the past do not differ in important respects from judgments about present objects [2], it is clear that typical scientific 'knowledge' includes not only social factors in verification but also an element of probability due to the use of leading principles controlled through observations of the way other persons and instruments report.

Thus, through the social process of communication, meanings — and few would hesitate to say knowledge — take on a social dimension. Certainly what passes as the corpus of scientific knowledge has this social character. Thus as there is at any time an unquestioned world within which problems appear and are solved, so there is at any time an unquestioned domain of meaning, largely

1. The view that while meanings consist of expectations, the object meant may be past, when combined with Peirce's doctrine of leading principles, avoids in my opinion some of the difficulties which G. Watts Cunningham has found in the instrumentalist's position. See his article, " On the Second Copernican Revolution in Philosophy ", this *Review*, XLI (1932), 107. Santayana suggests that " the backward perspective of time is perhaps really an inverted expectation " (*Scepticism and Animal Faith* 36).

2. See *Six Theories of Mind*, 314-316. On Peirce's use of the concept of leading principle as a foundation for the theory of probability, see Ernest Nagel's " A Frequency Theory of Probability ", *Journal of Philosophy*, XXX (1933), 533-554.

social in origin, in terms of which questions are raised. The individual may call in question any part of the world of existence or of meaning; but, just as existence as a whole is not problematic, so no question can be raised as to the meaningfulness of all meanings. Normal scientific usage would undoubtedly call the domain of the unquestioned meanings — in so far as they represent the results of previous processes of knowing — knowledge. Knowing, as opposed to knowledge, is an active attempt to repair a breach in the domains of meaning and existence when some part of these domains becomes ambiguous or problematic for conduct.[1] In this case 'knowledge' marks the termination of an investigatory process by the appearance of what is intended. To the knower, the unquestioned meanings are not so much knowledge in which to rest as tools to use in the problem at hand, and in the course of this process both the world of existence and the domain of meaning undergo change. There is thus an interplay between the individual and the social poles of meaning and knowledge; the individual as knower helps continually to test and redirect the social corpus of meanings which in their unquestioned form are the body of knowledge — the variable *a priori* of Lewis and Lenzen — which the individual uses in his problem. Science and positivistic philosophy are simply more exacting than common sense in demanding that meanings be given a hygienic birth and frequent sterilization.

---

1. The pragmatists have tended to identify knowledge with knowing. Mead specifically refuses to apply the term knowledge to the unquestioned world, whether of existence or of meaning : at best, it is 'known' only in the sense of being 'not-unknown'. The information gained from the reports of others is denied the name of knowledge, since for him knowledge is always a process of discovery, a process of knowing : " Knowledge... deliberately fashions hypothetical objects whose reality it tests by observation and experiment. " Much can be said for this position, since, if the world that is simply there is not a known world, it is consistent to deny that meanings simply there are knowledge. Granting this, some term is nevertheless needed to signalize the difference between meanings as they now function in a specific knowing process, and meanings which have so functioned successfully, that is, which have been verified. In the former case meanings are hypothetical, instrumental, tools; in the latter they constitute what would normally be called the body of knowledge. In so far as one takes the rôle of the generalized other, his theories and observation must square themselves with what is 'known'; in so far as one is at the focus of a process of knowing, what is 'known' becomes merely a body of meanings which must square themselves with what he as an individual finds. There is a genuine need for an analysis of the complementary individual and social poles of and contributions to meaning and knowledge. Such an analysis will find useful Dewey's statements on pages 186-188 of the *Quest for Certainty*, and pages 88 and 89 of *Philosophy and Civilization*.

V

This brings us to the realist's demand for a world which extends beyond the experienced world and within which experience arises. We have already seen that the phrase 'independent of experience' can mean 'independent of any particular experience', since by rôle-taking and by communication certain statements are found to be true regardless of the presence of any particular observer. This room is independent of you since you can go out of it and I can report, with the proper regret, its continued existence; and, unfortunately, you can do the same for me[1]. But independent of you at time t and independent of me at time t' does not mean independent of both you and me at all times, though, if you and I and others and the times are numerous enough, fatigue will probably incline us to the view that it does, just as it leads some logicians and mathematicians to transform an endlessly generative process into an actual infinite. But we are not left to depend on fatigue.

Even on Mead's account we take the rôle of physical things. Now my suggestion is that when this occurs things may in a sense report to us just as genuinely as persons do[2]. It is because of our knowledge of the relations of photographic plates to surrounding objects that we take the plate in question as evidence for the existence of objects independent of any and all experiences; it is because of our knowledge of building that we are confident that this room existed before our entrance into it; it is because of the observed relation of bones to flesh that we take the fossil as

1. Similar processes serve as checks on memory; my memory as to the nature of an object can be verified by your report made in the presence of the object itself, just as my records made in the presence of events can be used to check the memory of the events.

2. For the place of rôle-taking in the perception of the physical thing, see *The Philosophy of the Present,* Supplementary Essay II, and Part II of *The Philosophy of the Act.* Mead at times, though rather vaguely, speaks of " indirect evidence " in the process of verification. See also Mill, *A System of Logic,* Bk. III, Ch. xxiv, sec. I. In this connection attention should be called to the article of Moritz Schlick, " Positivismus und Realismus ", *Erkenntnis* III, II. 1, which aims to do from the standpoint of logical positivism what the present article attempts from the standpoint of a pragmatic positivism, namely, to investigate the degree of realism compatible with a strict empirical theory of meaning. By and large the results are the same, though Schlick would not use the term 'metaphysics', and lacks — to his disadvantage I believe — the social dimension of the pragmatic account. I hope later to compare these two versions of contemporary positivism.

evidence of an animal that once lived; it is because " the processes must have worked long enough to produce the result "[1] that we extend beyond us an immense geological past; it is because we see people born and die that we 'know' that we were born and shall die; it is because the other side of the object can be reported to me while I advance toward it that I believe that what for me is only a future possibility of experience is itself a now existing actuality; it is because we can watch embryos become selves that we can meaningfully talk of the emergence of selves and minds from simpler levels; it is because we observe physical objects conditioning the birth and growth of the child that we put these physical levels earlier in time, even though we as selves are attentive first to social objects and only later to physical ones; it is because we can experience the severance of the experience-relation between a self and a world of objects that an empirical theory of meaning can meaningfully discuss the origin of experience itself[2]. It is in such directions that the evidence points, and the dissension or doubt that is more than an expression of fatigue or wishful thinking must produce the evidence upon which it rests.

Thus empirically founded, socially generated, and capable of constant correction and confirmation, there arises a realm of meaning with the recognizable features of the domains of science and cosmology. Through the mechanism of the generalized other the individual is able to roam in imagination the deepest reaches of the world, watching himself and even mankind at large play a part in a wider universe; and through the reports of others and finally of objects — reports in part empirically and personally verifiable — the individual obtains the evidence which transforms the life of imaginative rôle-taking into science and into philosophy. As realists we survey the world from the standpoint of the generalized other (from " the standpoint of God ", from the " point of view of eternity "); as positivists we put ourselves at the focus of an ongoing act, seeing the world from our unique corner. As realists we have and enjoy knowledge in the sense of unquestioned meanings em-

1. Hotchkiss, *The Story of a Billion Years*, 15.

2. In this way an empiricist can meet the challenge of E. A. Burtt that empirically the order of existence must be the order of discovery (" Real vs. Abstract Evolution ", *Proceedings of the Sixth International Congress of Philosophy*, 168 ff.), and resolve the doubts which beset Mead concerning Dewey's emergent realism.

pirically and socially sustained; as positivists we are knowers and after knowledge, the knowledge of the realist now becoming a mere tool in our inquiry. Each in fact needs and uses the other, and an adequate account of knowing and its results must do justice to both.

To the degree that the preceding analysis is sound, an empirical cosmology is possible that differs from science only in its comprehensiveness. In Whitehead's phrase, such a metaphysics is a descriptive generalization, empirical in origin and empirically controlled[1]. It rejects any statement not based on evidence and not controllable by further evidence, though it recognizes the instrumental character of meanings not yet put to the test — indeed, to have a mind at all is to be acting toward a world that is wider than the world that is given. I have tried to call attention to neglected empirical data furnished by the pragmatist upon which a realistic type of cosmology can be based. Unless the argument is faulty or the counter-evidence stronger, pragmatism and realism, after some valuable testing of heart, can renew the old allegiance which they had in Peirce and James, while the emergent naturalism or realism which Dewey and Mead seem to imply is finally connected with and made respectable on the basis of their theory of meaning.

As a generalization of empirical data a world-view which is not to stagnate in the bare contemplation of given meanings must in turn submit to further verification. The heart of philosophy must lie in conceptual analysis and fidelity to empirical detail. The philosopher must continually ask kimself, what exactly do I mean or expect? Upon what empirical evidence is this expectation based? How can it be most adequately verified?

As the extreme generalization of the reflective process, philosophy like science needs both speculative boldness and the greatest fidelity to fact. Metaphysics has given speculative boldness and vision; positivism has given intellectual asceticism and technique. The program and foundations of pragmatism make possible, perhaps for the first time, an empirical realism faithful both to an empirical theory of meaning and to the recognition that meaning does and should at any given time outrun the world that is there.

1. For Peirce philosophy is an empirical science, since " it confines itself... to the universal phenomena of experience " (" The Regenerated Logic ", *Monist* VII (1896) 23, 24). We have noticed Dewey's similar view.

IV. THE RELATION OF THE FORMAL AND EMPIRICAL SCIENCES WITHIN SCIENTIFIC EMPIRICISM[1]

I

It is a fact of significance that various national groups are beginning to be conscious of an underlying unity coördinating directions of intellectual activity of diverse emphases. The difference of emphasis is to be encouraged — it shows intellectual vitality; but the existence of the unity of temper is no less important. This sense of unity may be suggested by the term " scientific empiricism ". The common temper lies in the merging of the empirical habit of mind with an emphasis upon logical analysis and conceptual clarification — the merger actually effected within science. It is not possible in a short time to characterize this temper more exactly, or to attempt to show in sufficient detail the complementary character of the results obtained through the various emphases which this common framework permits. Rather will this attitude of mind and the convergence of results be illustrated by choosing for treatment a problem where divergence might seem to be greatest — the relation of the formal and the empirical sciences. Stress shall be laid upon the treatment of this problem in terms of two groups which at first sight might seem in opposition, namely: the pragmatists (or biological positivists), and the Wiener Kreis (the logical positivists). In particular, though dispensing with specific references, I shall have in mind Peirce, Lewis, Mead, and Dewey on the one hand, and Carnap, Reichenbach, Hahn, Schlick, and Waismann on the other. An attempt will be made to show in what way the formal sciences can be

1. Reprinted from *Erkenntnis*, vol. 5, 1935.

brought within the scope of scientific empiricism, and how the apparent sharpness of the contrast of pragmatism and logical positivism is mitigated by a convergence on the interpretation of the nature of logic. (The relation of these two movements is further discussed in the *Proceedings of the Eighth International Congress of Philosophy,* " The Concept of Meaning in Pragmatism and Logical Positivism ".) [Essay II of the present pamphlet].

It is clear that logic and mathematics, when employed in the construction of an empirical science, fall outside of the science under construction, and yet that logic and mathematics themselves make use of symbols, — and the study of the symbolic process falls within empirical science. In this way there arises an ambiguity as to the sense in which the formal sciences fall within empirical science and the sense in which, as presuppositions of scientific activity, they fall outside of science proper. The relation of the formal and empirical sciences thus becomes a problem, and the rationalism-empiricism controversy has appeared in modern dress.

It cannot be said that the logical positivist, in spite of his temperamental rejection of metaphysical Platonic realism, has in any clear fashion related his logicism and his positivism. That the type of considerations which pragmatism has stressed may offer some hope for a modern reconciliation is at least suggested by the fact that the later developments of logical positivism show a strong agreement with pragmatism in tending to interpret logic and mathematics as complex developments of the linguistic process, and so as falling within a general theory of symbolism. The frequent contention that the formal sciences serve as methods for the tautologous transformation of propositions into other propositions, can easily be united with the pragmatic view that the formal sciences are in practice instrumental to the empirical ones. The increasing recognition that the formal sciences depend for their development upon the acceptance of certain rules of operation fits in naturally enough with the position that which rules are to be accepted is itself dependent upon human purposes at work within a specific empirical domain. Our task is to elucidate more adequately what is behind these tendencies found in logical positivism itself. What is the nature and interrelation of the logical, the empirical, and the purposive? These are the essential points at issue. We must, on the one hand, do justice to the actual differences between the formal

and the empirical sciences, but, on the other hand, attempt to bring both within a unified system of knowledge.

II

We may approach the problem through a consideration of the way that symbols function in human reflection. Let us take the concrete and typical case of a man who notices smoke in a crowded theatre. It is possible under such conditions simply to cry out "Fire!" But it is also possible for the man to identify or symbolize the smoke as "smoke". To react to the given event as smoke is to react to be sure, but to react in a specific way: the event is responded to in terms of a way of acting to certain situations of which the present is only an instance. Certain expectations are set up which have both biological and psychological correlates, and these have their own symbolic surrogates. Thus there may be a fire, and the tendency is to utter the word "fire" itself, since, like all symbols, it is part of the complex act of behavior. But this tendency to behavior arouses further expectations and their symbolic substitutes. The man expects a panic in the crowd, and the unfavorable or negative reaction to this expected result inhibits the tendency to call out "Fire". And so the process continues.

It is such a situation that we normally describe as reflective. We would ordinarily say that the person responded to the meaning of the event called "smoke", that he "saw" the possible consequences of his action, and that in virtue of these consequences he decided not to cry out. No scientist would doubt that however complex the details, the whole process could be traced causally. The point is rather that there is within the process of behavior a special type of behavior involving the complex operation of symbols in which the final action is controlled by the reactions to the consequences foreseen or presented by the operation of the symbols. It is because smoke means fire, and because the utterance of the word "fire" means a panic, that the word is not uttered.

Now, in such a situation what is to be designated as "logical" and what is its relation to the empirical factors? The logician would brush aside smoke and fire and panic as existential events. That smoke as an event is always found with fire, and that the two are always accompanied by a panic when occurring in a crowded theatre, is an empirically false proposition. It is similarly

false that the appearance of smoke always leads to the expectations of fire and panic. But what now of the symbols " smoke ", " fire ", " panic "? As physical reactions they are simply part of the whole complex act of behavior. What are they as logical meanings and what are their logical relations? The answer may appear if we direct attention to the fact that the man in question has various tendencies to action (expecting fire when smoke appears, acting so as to prevent panic), the reflective process serving to determine which type of action is to have overt expression. There is thus something hypothetical or tentative about the implicit actions which try themselves out before the final overt action takes place. Now, to tend to act in a certain way means, when formulated in terms of the behavior components which serve as symbolic surrogates of the tendency, to act upon a certain rule : thus, " When smoke is seen, expect fire. " Expressed syntactically, the rule is that certain expressions in which " smoke " appears can be transformed into (i, e., logically imply) certain expression in which " fire " appears. One further step is necessary. To study merely what tendencies to action are in fact operative, and what are the existential consequences in general of a certain action, is to remain within the field of the empirical reflective process. In abstraction from these particular kinds of empirical questions, *logical analysis is the determination of what we are committed to within the domain of symbols if we allow a certain habit in the use of symbols to proceed, i. e., if we follow a certain syntactical rule. And the relation between symbols so considered is a logical relation.* The rule itself may be one upon which we have been accustomed to proceed or it may be a rule set up for consideration. In either case in logical analysis it is hypothetically taken in order to trace the consequences in the use of symbols dictated by the bare observance of the rule itself — other consequences being of no interest to the logician as such.

Applying this analysis to the example considered, the symbol " smoke ", on the rule that expressions in which " smoke " appears may be transformed into expressions in which " fire " appears, commits us to these expressions about " fire ". A further rule commits us to expressions in which " panic " appears, and the two together commit us to the transition from " smoke " to " panic " through the mediation of the symbol " fire ". The structure of lo-

gical relations begins to appear in recognizable form as soon as attention is transferred from empirical claims as to the way events will happen, or from the expectations which a particular person has, to the interrelations of symbols dependent solely upon the acceptance of rules for the use of symbols. The biological analogue is the tentative acceptance of ways of acting in order to trace their possible consequences.

The behavior correlate of logical analysis is thus that moment of freedom in which the individual directs his behavior through a consideration of the consequences which follow upon tentatively considered types of activity. The relation between empirical considerations in general and logical analysis is analogous to the relation between the whole reflective process and that specific moment of reflection in which one says: "If I so choose to act, what then am I committed to through this choice?" The formal logician simply restricts himself to those parts of the act which serve as symbols and to those rules of behavior which are rules of symbolic usage.

III

We shall now investigate the sense in which logic (and mathematics by implication) is itself an empirical science. We begin by considering the relation of rules to empirical data and to human purposes.

Nothing is historically clearer than that the usages of symbols, like other rules of behavior, do undergo change. It is not so frequently recognized that with each change, however superficial or profound, a new logical analysis is necessary, that is, a new clarification of the structural relations between meanings, — just as the cross-section of a tree is different at each moment of growth. The change in the system of meanings is partly due to changes in empirical subject matter open to investigation, and partly due to the suitability of the symbols for realizing the ends for which they are employed. There is thus a dual control of thought, empirically by the experienced environment, pragmatically through human purposes. Changes in raw material demand new rules of manufacture, — but so do changes in human needs or interests. Calendars bear a relation to empirical observations, but complications through their continued use lead to new calendars, and to

the search for new data upon which new rules can be built. If smoke and fire should lose their empirical togetherness, the relations of the symbols would in time change. If refusing to call out " Fire " in a crowded theatre had certain unforeseen and undesired consequences, this particular rule of behaviour would be weakened or replaced. Symbols are instruments, and like all instruments vary with the material to be worked and the ends to be achieved. Meaning varies with data and purpose.

What is here suggested can be generalized in the concept of the variable *a priori*. There is at any moment, for thinking beings, an *a priori* in the sense of a set of meanings in terms of which empirical data are approached, and logical analysis may be regarded as following the structural lines of the *a priori* which support inference. This *a priori*, however, undergoes change through contact with the new data which are encountered through its use, and through changes in human interests and purposes. With every such change the *a priori* is altered, and new content for logical analysis is provided. Acting on the new set of meanings brings new data and new purposes, which in turn affect the content and structure of the *a priori*. And so the spiral process continues.

It should be noted that this account takes up into itself as partial accounts contentions which are frequently regarded as mutually exclusive : with the conventionalist of pragmatic stamp it agrees that variation in the *a priori* is (in part) a function of the needs and purposes of thinking men; with the older empiricism it agrees that meanings bear the imprint of former converse with experienced existence; with the formalist it admits that the determination of what sign combinations follow from the acceptance of certain rules for the use of symbols can be carried out in complete abstraction from the question of the relation of the signs in question to other existences. Symbols have relations to purposes, to existent objects, and to other symbols, and pragmatic conventionalism, historical empiricism, and logical formalism are revealed as valid emphases which become false only when paraded as the whole truth.

There are those who would admit the above account of the variable *a priori* for the natural sciences, but who would feel that logic and mathematics have a place apart. This claim we must examine. As involved in all science, and indeed in the above

account itself, are not the formal sciences in some sense presuppositions of all reflection, and, therefore, outside of empirical science proper? Indeed, in the very admission that conventional factors and logical structure are to be discriminated from empirical investigations, is there not an admission that not only pragmatism and formalism are transcended, but empiricism as well?

It must be admitted that in a sense this is so, since the factors discriminated are discriminable factors. But in another sense, it is not so. For, how can the above analysis itself be justified if in a wider sense of empiricism (namely, control by the entire given) the analyzed factors are not found in the situations under consideration? That at a more complex level of reflection we can find "empirically" that a lower order reflective situation involves conventional, logical, and empirical moments certainly complicates empiricism, but does not contradict it. We are able, in fact, to analyze this later act of reflection (say the one involved in this paper), and find in it the three moments, and then by generalization to affirm hypothetically that all reflective situations have the same three components. In a similar way, presuppositions can be made an object of empirical study even though in this study presuppositions are operative, — as a later empirical investigation can show. It is no more surprizing that logical analysis can itself be made an object of empirical study, even though logical analysis and its results are used in the study, than that breathing scientists and the results of breathing are themselves presupposed in the study of the respiration of scientists. Thus the contrast of the logical and the empirical, real enough at any moment, is a relative distinction, since the logical aspects of one moment may in turn be the empirical data of another, just as the history of thought reveals instances in which synthetical propositions of one period become analytic propositions of another, and vice versa. Logic as the science of logical analysis can without inconsistency be an empirical science.

The determination of the consequences of following a rule in the domain of symbols is no less an empirical question than the determination of the consequences of following any other rule of action. Passing to the level of formal consideration means only that we restrict attention to the structure of a language and do not consider the non-symbolic connections of the symbols manipulated according

to rule; it does not mean that we relax at all our empirical habits of mind. *Formalism carried as far as possible reveals itself as a special type of empiricism within the domain of the vehicles of actual or possible symbolic reference.*

Thus, though logical analysis is to be distinguished from empirical investigation, logic as the science of the logical relations of symbols is an empirical science. Just as the study of the structure of a cross-section of a tree is empirical though the cross-section itself may be considered in isolation from the purposes which selected that cross-section and from a complete study of the tree, so is logic empirical though the logical cross-section of the domain of meaning permitting inference is considered in abstraction from the purposes it serves and from the process of which it is a cross-section.

The preceding analysis clarifies the apparent paradox that logical analysis as an instrument is used in the construction of the empirical sciences and as an object falls within empirical science. Since logic, even in the narrower sense of formal logic, is empirical, it should not be found surprizing that some (not all) pragmatists have taken a wider view of logic, considering it as the generalized study of the whole reflective process instead of simply the systematization of the formal or logical moment of that process. The wisdom of this wider usage shall not be argued here, but it is clear that such a usage can include all that the narrower conception of logic can demonstrate. The contrast is not between a formal and an empirical approach, but between a wider empiricism (which can itself be formalized if one wishes, i. e., presented in the form of a calculus), and a narrower empiricism (formally expressed) concerned exclusively with the systematization of the principles of logical analysis.

Our discussion has shown, in fact, a significant convergence of pragmatism and logical positivism in the domain of logic through a common approach in terms of the symbolic process. Pragmatism can deal with what is genuine in the contrast of logical analysis and empirical investigation in terms of its account of that stage of the reflective process in which one investigates commitments in the use of symbols, due to the acceptance of syntactical rules; while logical positivism in its stress upon syntax finds itself moving into the domain of pragmatic considerations as soon as it considers the

method of its own procedure, what factors determine the acceptance of rules, and what function the formal sciences play in the entire reflective process.

IV

We have been discussing the relations of the logical, the purposive, and the empirical. We have seen that while these three factors are on a par in any concrete situation (because of the triple relations which symbols sustain), in so far as knowledge is concerned the empirical factor gains a predominance over the others, since the knowledge that the factors are all present demands the verification of that proposition through empirically finding the factors present in situations open to inspection. The result is that with reference to knowledge, pragmatism, logical positivism, and the earlier forms of empiricism reveal themselves as special complementary emphases within a wider positivism, where positivism designates the doctrine that propositions claiming truth are to be accepted only to the extent that they are controlled by direct confrontation of the object or kind of object meant. In default of a better name, this widened positivism may be called "scientific empiricism".

The significance of this general result is sufficiently clear. It permits the recognition as equally legitimate of the study of the formal relations of symbols (the investigation of possible languages), the study of the empirical relations of symbols to existent objects (the investigation of actual languages), and the study of the relation of symbols to behavior (the investigation of the function of actual and possible languages). But it not only justifies the attitudes of the formalist, the empiricist, and the pragmatist : in terms of the concept of the variable *a priori*, it is able, without in any sense weakening the basic denial of *a priori* synthetic judgments which is typical of all the groups here considered, to envisage these three attitudes as revealing complementary aspects of the developmental process of scientific thought. Through seeing both the methodological separation and the historical and behavioristic interplay of logical analysis and empirical investigation, it transcends in terms of the temper of scientific empiricism the historical limitations of the earlier forms of rationalism and empiricism.

We have considered only one aspect of the unification of the forces of scientific thought which a widened empiricism makes

possible. If a similar result holds for other problems and other groups than those here considered (and I know of no other place where the issues seem to be capable of such divergent emphases), there arises not only the possibility of integrating and unifying the edifice of science from within, but also of enabling science to become conscious of itself as a whole, and to present its unified power against the factors which threaten science from without. For upon the solution of the conflict as to whether the scientific or the anti-scientific habit of mind is to dominate in the domain of social problems depends in large part the direction of future civilization.

V. SEMIOTIC AND SCIENTIFIC EMPIRICISM[1]

An interest in the nature of signs has been historically one of the most characteristic accompaniments of the various manifestations of empiricism. It is the aim of the present paper to consider these two interrelated tendencies, under the conviction that what is most distinctive of the mentality expressed in this Congress is the joint emphasis upon logical analysis and an empirical theory of meaning, and that when these two tendencies are pushed to their completion they eventuate on the one hand in a general theory of signs or symbols (semiotic) and in a variety of empiricism which finds its center of orientation in scientific methods and results, and which accordingly may be designated as « scientific empiricism ».

It is felt that this type of empiricism, grounded on a theory of signs, unites the main attitudes of formalism, traditional empiricism, and pragmatism, and avoids the defects of Hellenistic, Medieval, and British empiricism while yet continuing the tradition of which they are a part.

1. Notes on the History of Empiricism.

The Greek classical period had in general assigned to experience a low place in comparison to science regarded as that which could be rationally demonstrated[2]. Further, Greek rationalism was metaphysically conceived; the human mind either innately had, or could receive through an intuitive discernment of experienced particulars, absolute and universal first truths, and from

---

1. This paper, selections from which were read at the *First International Congress for the Unity of Science*, also appears in English in the Proceedings of that Congress (Hermann, Paris, 1936).

2. See Dewey, « An Empirical Survey of Empiricisms », in *Studies in the History of Ideas*, vol. 3, 1935, Columbia Univ. Press.

these could be demonstrated by the use of logical principles (equally necessary and of equal ontological status) other truths of a similar nature. In this way an essentially mathematical methodology was given preferred status, and science was conceived as metaphysics. As Kant clearly saw, the distinguishing characteristic of metaphysics is the acceptance of *a priori* synthetic judgments, and the philosophically verbalized logic and science of the Greek classical period is metaphysical in that sense[1].

The empiricist had little chance of attracting attention until the metaphysicians had talked long enough to reveal their disagreements. It is obvious that the first problem the empirically minded (or, in the modern sense of the term, the scientifically minded) thinkers would have to face would be the negative one of calling in question all forms of dogmatical metaphysics. This was done by the Sophists, the Sceptics, and to a degree, by the Epicureans. It is interesting to note that both the attack and the defense were made in terms of a theory of signs[2]. The Stoics, who like Locke and Peirce conceived of logic as semiotic[3], and who are among the important forerunners of symbolic logic, thought that the relation between signs was a necessary one, and mirrored the necessary relations between things; the Stoic position therefore implicitly involved a defense of metaphysics in terms of a theory of signs. The Epicureans on the contrary, stressing induction and an empirical theory of meaning, opposed the Stoic view by an insistence upon the hypothetical and probabilistic character of significatory relations, and so of all knowledge[4]. The Sceptics went even farther : they detected metaphysical remnants in the Epicurean retention of indicative signs able to signify the "atoms and the void" of Democritus, and rejected all sign rela-

---

1. To me the rejection of metaphysics means only the empirically grounded rejection of such judgments, and does not entail the rejection of an empirically grounded cosmology, as some positivists seem to hold.

2. An as yet unpublished thesis of Dr. Estelle M. Allen, *Meaning and Methodology in Hellenistic Philosophy*, deals with Greek empiricism and theory of signs.

3. Diogenes Laertius, VII, 62; Locke, *Essay* IV, Chap. 21; Peirce, *Collected Papers*, II, 52, 134.

4. See especially the treatise by Philodemus, "On Signs and Signification" edited by T. Gomperz, in *Herkulanische Studien*, Band 1, 1865. There are discussions of the treatise by F. Bahnsch (1879) and R. Philippson (1881). It is doubtful whether any equally interesting treatment of induction appeared until the nineteenth century. As for the Sceptics, the tropes of Agrippa may be regarded as decisive refutations of the metaphysicians in term of their own professed dialectical method.

ions except those in which the connection between sign and signified was an empirical one[1].

This noteworthy rejection of metaphysics through an analysis of the significatory relation might have been only the preparation for something positive, but the domain thus opened for philosophy was never conquered to any great degree by the ancient world. It is significant that most was accomplished by such thinkers as Menodotus and Sextus Empiricus who were in contact with the medical tradition empirically oriented and formulated in terms of the concept of sign[2]. A constantly recurring emphasis in Sextus is the desire to see substituted for the science of the dogmatists a science based on and controlled by the study of phenomena, and he is aware that over and above science so conceived there remains no distinctive sphere of philosophy with its own method and its own peculiar type of certainty. This is not the occasion to assess the contributions of Hellenistic thought to semiotic and to empiricism, — it is sufficient to call attention to the importance of the material[3] and the need for re-evaluating the entire history of thought from the perspective of science and scientific philosophy. The important and rapidly developing interest in the history of science should be an important aid in this connection.

By and large the Hellenistic age placed a premium upon philosophies of life, and the significant Greek science of the period had no great influence upon philosophy. The cultural nexus of the early Christian centuries brought into prominence an emotively grounded quest for certainty, and metaphysics rather than science best met this need. Such indeed is the story of many centuries, and only gradually did the slow accumulation of material gathered partly by the scientifically curious and partly as a result of technological advances find the needed change in men's emotional needs and interests to permit of new ways of looking at the world and

---

1. See especially Sextus Empiricus, *Adversus Dogmaticos II B.* The appearance of Sextus in English dress by R. G. Bury is welcome.

2. See especially the Hippocratic treatise, "On Ancient Medicine". Throughout the history of thought the empirical tradition has been nourished most by the life-sciences, while rationalistic metaphysics has drawn its support from mathematics, logic, and physics, — only today in fact has empiricism been able to assimilate these sciences and to draw its material from the entire range of scientific investigation.

3. For the relation of Greek scepticism to English empiricism, see V. Brochard, *Les Sceptiques Grecs*, especially 375-380.

the elaboration of conceptual systems other than those of Plato, Aristotle, and the systematizers of Christianity. But though submerged, the history we are schematically tracing was not broken, and a second period in which semiotic and empirical interests were intertwined is that of late medieval Europe. The influence of Aristotle's logical writings, especially the last pages of the *Posterior Analytics,* was a decisive factor, while the influence of Greek-Arabian science was a second. Nor must it be forgotten that something of the semiotic emphasis of Hellenistic thought filtered in through Boethius, and that Academic scepticism as well as that of Sextus Empiricus is not without effect even in the twelfth and thirteenth centuries. Abelard is indicative of the combined empirical and grammatico-logical tendency, as is his pupil John of Salisbury. There follows in the thirteenth century a long succession of Oxford empiricists, summed up by Roger Bacon. William of Ockam, a great neglected thinker of the fourteenth century, inherits and develops the tradition of English empiricism. Ockam uses his theory of signs to develop a functional non-entitive theory of universals. The emphasis upon signs determines the approach to logic, and the predominantly speculative approach of the earlier philosophical grammarians (who sought to establish a complete isomorphism between grammatical categories and the characters of being, and thus to bring grammar within the framework of Aristotelian metaphysics)[1] gives way to a primarily empirical study of signs in which logic and grammar intertwine. Thus the late medieval world, like the late classical world, came to see that linguistic and logical analysis is not metaphysics, and dimly to see that the foundations of both grammar and logic are to be sought in a general theory of signs, or as it was then called, in a *scientia sermocinalis.*

In the contemporary world the same tendencies are again prominent, and it becomes advisable and possible to reëxamine the work of the medieval logicians. Such reëxamination will undoubt-

1 There is an essay upon the speculative grammarians by M. Grabmann in his *Mittelalterliches Geistesleben:* a portion of a speculative grammar by Siger of Courtrai is published in G. Wallerand's edition of his works (1913), which also contains a useful section on the whole movement; the best known of the speculative grammars is, of course, that of Thomas of Erfurt, attributed to Duns Scotus before Grabmann's research.

edly result in a much higher estimate of the work of Abelard and Ockham, will lead to a new evaluation of nominalism[1] by considering it in terms of the history of logic and empiricism rather than solely from the standpoint of the metaphysician[2], and it will probably show the unbroken connection of symbolic logic with the directions indicated in Hellenistic semiotic and medieval *scientia sermocinalis*. It is with satisfaction that one notes Lukasiewicz, Scholz, Lutman-Kokoszynska, and Tornay turning their attention to this material.

The third period of combined empirical-semiotic interest is the best known and the most influential, — that of English empiricism of the seventeenth to nineteenth centuries. From Bacon through Mill opposition to rationalistic metaphysics is supported by an analysis of the nature and limitations of language. I shall presume acquaintance with this movement and confine the discussion to several remarks. By the time of the period under consideration modern science had taken on its distinctive and typical features, and the new empiricism was oriented around science. But science itself had found certain features of the Pythagorean-Platonic-Augustinian tradition useful in its attempt to free itself from the scholasticized Aristotle, to carve out a domain of investigation restricted enough to be manageable, and to buttress up its confidence in its mathematical quantitative methods. Science itself was in this way infected with metaphysics, and it is this fact that helps to account for Hobbe's difficulty in uniting rationalism and empiricism, for Locke's struggle between subjectivism and realism, for Berkeley's ability to turn the current confusion to his own ends, and for Hume's scepticism. The work of the Greek Sceptics and the Medieval Ockhamists had to be done over again, and not only against philosophers but against scientists as well. The general significance of Hume lay in the fact that he wiped the slate clean again : science and philosophy alike had to be built anew or be relegated by critical minds to the limbo of dogmatism.

---

1. See Jos. Reiners, *Der Nominalismus in der Frühscholastik, Beiträge zur Ges. der Phil. des Mittel.*, vol. 8, 1910. For Abelard's logic see *ibid.*, vol. 21, 1919, ed. by Bernhard Geyer.

2. What for instance is the relation between the development of the algebraic emphasis in mathematics and semiotic? the bearing of the latter on symbolic logic? the detailed relation of medieval empiricism to early modern science?

One important qualification must be made, for the slate was not in fact wiped entirely clean. Hume's empiricism was not empirical enough : with English empiricism in general it shared the taint of subjectivity. The Greeks had been bothered with the relation of the given to the non-given, but the problem had not taken the form of passing to an outer world from an inner, mental, subjective, individual world of experience, — the Greek conception of experience was in the main implicitly social. The central currents of Western thought had, however, stressed the ultimate significance of the individual self, and when science found it useful to accommodate itself to features of this tradition, the influence was too great to be resisted by English empiricists. The resulting lack of a critical theory of mind is the signal weakness of the movement. The reliance upon uncriticized individualistic notions of mind directed attention away from a study of the social aspects of knowledge and experience, and from investigation of the concrete ways in which the individual attains beliefs about objects other than those personally experienced, while at the same time controlling such beliefs in terms of his own experience[1]. A failure to integrate positivism with naturalism has been an almost constant scandal in the history of empiricism, but it becomes most evident in the tradition of Locke, Berkeley, Hume, and Mill.

Auguste Comte may be regarded as the beginning of, or at least a transition to, the fourth or contemporary period of empiricism. The basic feature of contemporary scientific empiricism is its orientation around the methods and results of science, — a science that has not only expanded enormously in scope but which has become increasingly critical in temper. While previous empiricisms were largely attacks upon dogmatism, the present forms are characterized by the positive character of their contributions. Lacking the support of a victorious science, earlier empiricisms tended frequently to be driven back to the individualistic or

1. The last clause is important, for it stresses the function of the individual in the control of beliefs, social and scientific. It is here that the true significance of English empiricism (and of present-day " methodological solipsism ") is to be found. To recognize this, however, does not make the analysis of the text invalid, for if science is in the mentioned sense individualistic, it is also a social process eventuating in a naturalistic cosmology.

the subjective; contemporary empiricism, resting on science, takes on the co-operative character of the scientific enterprise, and recognizes the social element in knowledge, — as in science, its objectivity is a social objectivity. Accompanying this shift from the individual to the social, is the corresponding shift from an essentially individualistic psychology to an objective psychology, the implication becoming ever clearer that meaning is not only socially conditioned in genesis and in practice, but that potentially every meaning is intersubjective, so that meaning becomes an objective phenomena to be studied as are all other phenomena. The place of mathematics and system-building in the sciences has led the new empiricism to do justice to and to utilize the formal sciences, while the theory of signs, now developed far beyond any previous state by the combined attacks of logicians, linguists, psychologists, psychopathologists, biologists, and social scientists, makes it possible for the first time to bring formal logic and mathematics within an empirical philosophy. The fact that the contemporary movement is post-Darwinian has made it critical of the concept of mind and attentive to the pragmatic aspects of scientific procedure. Finally, the above factors taken together make it possible for scientific empiricism, while holding fast to the control function of individual experience, to avoid subjectivism and to issue in an empirical realism or naturalism.

The systematic elaboration of most of these points cannot be attributed to Comte, but many of them are natural correlaries of his orientation of empiricism around science. One-sided though it sometimes is, Comte's stress upon the category of the social is his most significant contribution to empiricism [1]; if a second choice had to be made it would probably fall upon his interest in a positivistic philosophy of history. The movement inaugurated by Comte finds a complement in American pragmatism [2], which (with the partial exception of Peirce) has primarily investigated the psychological, biological, and social functions of the symbolic process, factors commonly neglected in semiotic. Perhaps the most important single contribution of pragmatism has been the development of a

1. For the epistemological consequences, see M. Uta, *La théorie du savoir dans la philosophie d'Auguste Comte,* 81 ff.

2. Popularly surveyed in my pamphlet, *Pragmatism and the Crisis of Democracy.* Hume and Kant are important figures in preparing the soil for pragmatism.

general theory of mind upon an empirical basis [1], thus strengthening one of the weakest joints in the empiricist armor. Poincaré's conventionalism and Mach's stress upon the principle of economy may be regarded as related emphases within special fields of science.

A second direction of contemporary empiricism has been the interest in carrying out in detail the thesis that the meaning of any concept that claims existential import can be reduced to, or at least regarded as predictions of, direct elementary experiences. The writings of Peirce and James are to be mentioned here, as are the writings of Mach, much of the work of Schlick, Bridgman's operational theory of meaning, the epistemological writings of Carnap, and the physical studies of Reichenbach and Lenzen. In general this group of thinkers has not stressed the category of the social, but has kept alive the recognition of the fact that the ultimate control of theory lies within the experience of the individual. The pragmatic emphasis upon the predictive and operational aspect is novel, but with minor exceptions the continuity of this group with English empiricism is evident. The gradual transition from this latter form of empiricism to the contemporary form of scientific empiricism may be followed both in the development of American pragmatism and in the logical positivism of the Wiener Kreis.

The third distinguishing tendency of contemporary empiricism is the great interest in the formal sciences of logic and mathematics. One immediately thinks, among others, of the names of Peirce, Russell, Hilbert, Lukasiewicz, Lewis, Carnap, Tarski. It is true that not all forms of interest in logic and mathematics today come from empiricists. Nevertheless, it is significant that many empiricists have adopted mathematical logic as a tool for logical analysis. Further, one aspect of the meaning of symbols lies in their formal or syntactical relations within a language, and this aspect of meaning is most clearly exhibited through postulational technique. The interest in the formal sciences is not however purely instrumental : there are those who wish to integrate the formal sciences within an empiricism wide enough to include observation of the manipulation of symbols. The eventuation of this tendency would seem to lie in grounding formal logic and

1. See Chap. 6 of my *Six Theories of Mind;* G. H. Mead's *Mind, Self and Society.*

mathematics upon a general theory of signs. Wittgenstein has made overtures in this direction, but the most significant contemporary steps have been taken by Charles Peirce [1].

Thus it is that scientific empiricism of the present combines, as does science itself, the three complementary attitudes of pragmatism, traditional empiricism, and formalism.

2. Semiotic, the science of signs.

The problem of signs (and so of meaning) is being attacked today more comprehensively than ever before. One need only mention among the living or recent dead the names of Vaihinger, Mead, Peirce, Whitehead, Husserl, Cassirer, Kotarbinski, Chwistek, Cunningham, Gätschenberger; Marty, Mauthner, Gardiner, Jespersen, Sapir; Freud, Jung, Jones, Head, Gelb, Goldstein, Meyer; Ogden, Richards, Hunter, Hollingworth, Tolman, Korzybski, Bühler; Scheler, Mannheim, Durkheim, Malinowski; Russell, Hilbert, Wittgenstein, Carnap, Eaton, Tarski, Saarnio, Waismann to realize something of the number of persons interested and the range of viewpoints represented. The very multiplicity is itself confusing. The purpose of the present section is to suggest a general framework in terms of which the various detailed studies and points of approach will take their place as aspects of the general science of semiotic.

Signs, at least at the more complicated levels, may be regarded as sustaining three types of relation : to objects, to persons, and to other signs. Thus the language symbol " house " is correlated with, and under some conditions functionally substitutable for, certain physical objects; when used in certain ways it arouses responses (and fulfils certain functions) of a psychological, biological, and sociological nature; it sustains certain relations with other symbols of the language of which it is a part so that certain combinations of these symbols are substitutable for it in discourse. It is clear that the natural scientists and the traditional empiricists have been most concerned with the first set of relations; the pragmatists, conventionalists, psychopathologists, biologists and social scientists with the second set; linguists, mathematicians

1. *Collected Papers*, especially volumes 2, 3, and 4.

and logicians with the third. The dominant interests of the members of these groups make it natural for them to think that they are dealing with " the " meaning of signs. In contrast to this tendency, which leads to a too facile use of " meaningful " and " meaningless ", it is proposed to define each of these three sets of relations as a dimension of meaning : the relation of sign to objects will be called M_E (to be read, " the existential dimension of meaning, " or, in short, " existential meaning "); the psychological, biological and sociological aspects of the significatory process will be designated M_P (" the pragmatic dimension of meaning, " or " pragmatic meaning ")[1]; the syntactical relations to other symbols within the language will be symbolized by M_F (" the formal dimension of meaning, " or " formal meaning "). The meaning of a sign is thus the sum of its meaning-dimensions : $M = M_E + M_P + M_F$.

It must now be emphasized that these three dimensions of meaning are interrelated in such a way that the meaning-situation forms an organic whole. The meaning-situation can be stated from either the object pole, the formal pole, or the life pole, and all such statements prove upon analysis to be equivalent in meaning. None of the three dimensions can be transcended, although anything that is said can be investigated from either of the three points of view.

The interrelations of the three aspects might be illustrated in a number of ways. Thus the formal structure of language is normally determined both by the nature of the empirical material encountered, and by human purposes reflected in linguistic decisions. This may be called the principle of the dual control of thought, and is to be contrasted to extreme conventionalism on the one hand and the theory of linguistic structure as completely isomorphic to the realm of existence on the other. Again, what objects are symbolized is in part dependent upon human interests and in part upon the language then available. Similarly, the pragmatic aspect of meaning expresses itself through a language with formal structure and yet must be responsive to the characters of objects as actually encountered. A concrete analysis of the process of knowledge reveals unmistakably the way in which

1. It would also be possible to label this the " biotic dimension of meaning " and symbolize it by M_B. " Pragmatic " seems to indicate more adequately the functional aspects of the process while yet including the biotic.

human interests, empirical fact, and formal analysis interact and mutually control each other.

We must think then of meaning in terms of the whole complex pattern of certain experienced items (themselves often elements in a linguistic structure) serving to orient persons in regard to certain objects for which the items in question have become functional substitutes. All such phrases as " thought of ", " the experience of meaning ", " reference to ", " intentional act " are merely ways of describing this process in terms of an introspective psychology, and give at the best a description of fragments of the process which in its entirety cannot be so described. What must be especially stressed as characteristic of the view here indicated is its insistence that meaning is a relational and functional complex and not an entity, subsistent or existent. The present position thus presents a functional alternative to the Platonizing tendency which in part springs from the attempt to find meanings among the objects which constitute the world rather than in terms of certain functional relationships among those objects.

The implication of this position for meaning-analysis is direct and important : to specify the triple set of relations which a sign sustains to objects, persons, and other signs is to exhaust the meaning of that sign, however difficult it may be to carry through the actual analysis. All meanings are potentially intersubjective; theoretically what any sign means can be exhaustively determined by any other person. There is therefore nothing peculiarly personal or private about meaning, though there are of course private aspects of the *experience* of meaning as of the experience of anything else. Experience is not however knowledge, nor as such meaning. The present position therefore reveals itself as in agreement with the first part of the thesis of physicalism, namely, the view that all propositions are in principle verifiable by everyone; it is compatible with the second part of the thesis (the view that all propositions are reducible into propositions of physics) under some interpretations of " reduction, " but it does not depend upon the truth or falsity of this latter position [1].

---

1. A kind of physicalism was developed in my *Six Theories of Mind*, but stated in terms of objects rather than in terms of the translatability of propositions into the language of physics.

The study of each of the dimensions of meaning and their interrelations would constitute the science of semiotic. The science which would result would itself have the three dimensions of meaning here isolated. Empirically and existentially its object would be the significatory process; formally it would be a symbol system with a syntactical structure capable of axiomatic presentation; pragmatically it would be an intersubjective body of propositions capable of numerous applications. Itself a science, it would at the same time be the *novum organon* of the special sciences and of the philosophy of scientific empiricism.

3. Scientific empiricism.

The three major defects of the historical forms of empiricism have been 1) the tendency to individualistic subjectivism, 2) the failure to do justice to the formal sciences, 3) and the inability epistemologically to unite an empirical theory of meaning with a naturalistic cosmology[1]. These defects are parallel to the neglect of some one or other of the three dimensions of meaning. Scientific procedure has been sounder than the empiricists who have thought to express this procedure; it has been socially co-operative, has utilized extensively the formal sciences, and has avoided the spectre of idealistic solipsism. Likewise, science has integrated and utilized all of the dimensions of meaning, and may be said to walk on the three legs of theory, fact, and practice. In the light of such considerations, a restatement of empiricism is demanded. This is not possible in a few words, but something may be done to suggest how the three mentioned inadequacies would fall away when attention is paid to scientific method and to the three dimensional analysis of meaning. The resulting empiricism I have called scientific empiricism.

The tendency to individualistic subjectivism is the accompaniment of an inadequate theory of mind. Previous to the contemporary period, the concept of mind had received no genuine analysis, and lacking such analysis it was natural to think of mind, as the metaphysician had done, in terms of the category

1. The essentially negative nature of past empiricism (as a reaction against dogmatism) and the failure to handle adequately the concept of universality are in part results of these three major inadequacies, and in part due to the fact that science (including semiotic) had not sufficiently advanced to furnish the necessary positive basis.

of immaterial substance. Minds were immaterial units that thought and received impressions. When the absolutistic pretensions to objective knowledge were seen to be hollow dogmatisms, it was natural to retreat to mind so conceived as a place of last refuge, — especially in periods where science was not developed enough or was not prominent enough to give a living example of the *via media* between dogmatic absolutism and anarchic individualism. From this mental cell one somehow used symbols to signify one's thoughts and to communicate them to others.

A minimum of empirical observation shows this whole account to be mythology. The pragmatists have done most toward reconstructing the concept of mind, — helped of course by the whole of post-Darwinian biology, and by the steady shift from an introspective to an objective psychology. The conclusion is that mind in the sense of "experience", "the given", "consciousness" may be regarded as objectively relatively qualities of the organism-environment reaction system; while mind in the sense of "thought of", "consciousness of", "intentional reference to" may be equated with the symbolic process, i. e., with the capacity of certain organisms to respond to events as signs. The mental in the second sense thus becomes the meaningful, and that in turn the symbolical. But since meaning is without residue potentially intersubjective, mind in this sense contains nothing that is intrinsically private even though much that is *de facto* private. Experience, of course, has its private aspects : one person's toothache is not another, any more than one person's perspective of a table is another's. Yet these facts do not mean that experience itself is without social or intersubjective aspects. The elaboration of this point would, however, necessitate the presentation of a theory of universals, and it is best to be content for the moment with the bare assertion that the prejudice against the concept of social experience should not be allowed to go unquestioned.

Mind reveals itself, then, as a natural process among natural processes, functioning within the process of adjustment of the individual and society to the environing world. The discovery and elaboration of the social, objective, pragmatic aspect of mind must be regarded as an important corrective of traditional empiricism.

The individualistic conception of mind expressed itself episte-

mologically in the failure of empiricism throughout its history to justify the realistic (in the sense of naturalistic) cosmology of science. By "realistic" is meant here only the system of beliefs that there is a world into which the individual is born, which he (along with other persons) experiences and knows, and which extends beyond the limits of his experience and the experience of others. The general problem has been dealt with elsewhere, and only a few supplementary remarks will be added here.

It was the uncriticized individualism of past empiricisms which made it easy to pass from the view that all meaning is empirical to the view that one cannot mean what he himself cannot personally experience. Thus to many persons, and especially to critics, solipsism seemed the logical result of an empirical theory of meaning. But it is at least clear that the compound set of symbols, "objects which I can never experience" is both formally and pragmatically meaningful : it corresponds to the syntactical rules of the language and it performs a regulative function in individual and social conduct, as the whole institution of life-insurance evidences. Doubt can then only refer to the dimension of existential meaning : Are there objects which I do not experience? The question is not one of understanding, for the social mechanism of mind (the process of rôle-taking which Mead has detailed) provides the mechanism for imaginatively transcending one's own perspective : the question is rather one of empirical evidence. Now it is here and only here that the individualistic emphasis of the traditional empiricism (and the "methodological solipsism" of Carnap) has hold of an important point, namely, if I am to accept or reject the proposition in terms of empirical evidence it must be evidence that I personally can empirically control. The fact, however, that for each knower experience provides the basis and criteria of all knowledge does not imply that the object meant is an object of actual or possible experience for each knower. Nor does this position open the door to the things-in-themselves of the philosophical tradition, for we can only mean, psychologically, what we can expect or imagine, and expectation and imagination are dependent upon what has been encountered. The result is that we can refer to non-experienced objects solely as non-given members of a class of objects whose nature has been empirically determined. Even the belief that there are kinds

of objects yet unencountered rests on the fact that objects unknown at one time have become objects of empirical investigation at a later time.

In assessing the evidence for empirical realism two cautions should be noted. Empiricists have frequently adopted the rationalistic criterion of science as logically demonstrative knowledge[1], a view which received classic expression in the *Posterior Analytics*. But this is the criterion of the formal sciences and of the natural sciences only in so far as they are thought of as formal systems; knowledge in the natural sciences is at a given time simply the then existing body of relatively stable and socially verified propositions. Empirical realism could ask no more than admission to the body of such propositions. Secondly, no difficulty arises from the use of the reports of others in science and in a theory of knowledge, since on the thesis of the potential objectivity of all meanings it is possible in principle for each subject to find out what other subjects mean and to check the truth of their affirmations, remembering always that to verify that x had such and such an experience does not require having the experience oneself. The fact that no postulate is required as to the actuality of communication suggests the epistemological significance of a critical semiotic.

The traditional neglect of the formal sciences by empiricists can hardly be charged to contemporary empiricists. Only a few words as to the general articulation of the formal sciences within scientific empiricism are necessary here. Such articulation does not involve, as might be supposed in terms of previous empiricisms, the obliteration of the distinction between analytic and synthetic propositions, or between the formal and the natural sciences, — it merely involves grounding the formal sciences upon semiotic and seeing them as specializations within the general study of meanings. The formal sciences simply restrict attention to the formal dimension of meaning; their task is to see what symbol combinations follow from other initially accepted symbol combinations through the performance of accepted rules of

1. This is especially evident in Locke and in Hume, both being thereby forced to the conclusion that "no science of nature exists". Scepticism is frequently a disappointed rationalism.

operation. In this study abstraction is made from both the existential and the pragmatic meanings of the symbol combinations under consideration[1]. It is in this sense that the formal sciences are formal. But since the study of any dimension of meaning can only proceed empirically, claims that a specific proposition is analytic or synthetic, that q is the consequence of p and r, or that system S is consistent, are (when certain qualifications are ignored) synthetic propositions, and true or false in the same sense in which propositions about things other than symbols are true or false. In this way the formal sciences[2], while preserving their own distinctive character, are brought within the scope of scientific empiricism and unified science, not merely as instruments but also as objects of investigation. The importance of the formal sciences is recognized, but without the metaphysical halo that accompanied Platonic, Aristotelian, Scholastic, Cartesian, and Leibnizian rationalisms. Modern rationalism is methodological rather than metaphysical.

4. Conclusion.

The program thus sketched is a comprehensive one. It calls attention to the significance for empiricism of the history of ideas. It envisages the expansion of the current emphasis upon logical analysis into a general interest in meaning-analysis, and this in turn into semiotic. It sees the current positivisms rounding themselves out into a scientific empiricism which by doing justice to the three dimensions of meaning is able to unite the attitudes of formalism, pragmatism, and traditional empiricism, and at the same time to give promise of resolving the inadequacies which have beset previous forms of empiricism.

---

1. Though not from the meaning of the rules. Cf. H. Reichenbach, *Wahrscheinlichkeitslehre*, p. 29.

2. The term "formal sciences" has been used in the plural so as to avoid discussion of the relation of logic and mathematics. At present all alternatives are current: logic as including mathematics, mathematics as including logic, mathematics and logic as independent. Clarification of the interrelations of the terms "logic," "mathematics," "methodology," "epistemology," and "semiotic" is badly needed.

TABLE OF CONTENTS

Imprimé en France

TYPOGRAPHIE FIRMIN-DIDOT ET Cie. — MESNIL (EURE). — 1936.